JOURNAL OF THE

BRITISH NAVAL MEDICAL SERVICE

Vol.
XXVI
2008

JOURNAL
of the
ROYAL NAVAL MEDICAL SERVICE

Vol 96 1 2010

Within the Ministry of Defence, the Editorial Committee of the JRNMS is responsible for the arrangements made for views put forward in this Journal including advertising, and for the

ISSN 0035 9033

Contents

Foreward

Surgeon Rear Admiral Lionel J Jarvis
QHS MB BS FRCR MRCS LRCP MIEE –
Assistant Chief of Defence Staff (Health)
& Chief Naval Medical Officer/Medical
Director General (Naval)

I follow the sentiment of my illustrious predecessors in experiencing great privilege in holding the title of Medical Director General (Naval) albeit these days in more of a titular than executive role. That, however, does not diminish the enthusiasm [illegible] taking on the role and for making what contribution I can to [illegible] small but critical component of Royal Naval and Defence capability. [illegible] taking up the accepted the proposal to align the role of Tribal chief of the RNMS with that of [illegible] RN sections with the title of Chief Naval Medical Officer, however, in view of the [illegible] heritage of the title and its close links to many external professional organizations, [illegible] Sea Lord agreed to retaining the MDG(N) title for those latter purposes.

As we pass through the long cold winter of 2010 towards the spring and summer months, Surgeon Commodore Noel Bevan and I recognize the significant challenges that face us as we work together with the heads of the RN Dental Service, Queen Alexandra's Royal Naval Nursing service and the Medical Services Officers, to secure a confident future in the era following the imminent Strategic Defence Review. The country is facing extraordinary economic difficulties, the global challenges are becoming ever more evident, and we are heavily engaged in war fighting in Afghanistan. No one can question the need for a Strategic Defence Review, but the timing, as we approach a May general election, makes for some potentially very difficult decisions. We must therefore be prepared to argue the retention of the strength of the Royal Naval Medical Service to support that to which Defence commits itself post SDR.

Right now, main effort is unquestionably to support the war in Afghanistan. The Royal Naval Medical Service has contributed substantially to this effort since initial entry operations, but evermore so since the firm establishment of UK Forces in Regional Command (South) and in Helmand Province since 2006. Support to Commando forces in 2009 was exemplary with widespread recognition of the professional and military skills of RN medical personnel from the MAs on the front line, through support to the Medical Emergency Response Teams (MERT) and on to the Role 3 medical facility at Camp Bastion. Back in the UK force preparation continues to be supported in primary care, secondary care personnel deliver the role 4 support, notably in Birmingham and at Headley Court, and numerous niche capabilities at the Institute of Naval Medicine provide 'round the clock' support and advice.

The recent external reviews of operational medical support by the Healthcare Commission and the National Audit Office sing high praise upon the high quality of delivery of care on operations – the RNMS must take its fair share of credit for this accolade, leading in areas of research, clinical skills and clinical delivery. We will now be building upon that expertise to prepare for the next significant RNMS deployment to Afghanistan early in 2011.

[illegible] symposium to be that of preparing for the [illegible] we must prepare for future challenges [illegible] approaches to expeditionary interventionist war [illegible] we will be ready for further similar [illegible] hope nor mean that significant challenges to [illegible] we must look with the rest of the [illegible] and to ready ourselves to respond.

The world [illegible] There looms a seismic change in the economic hierarchy [illegible] expected [illegible] new and developing BRIC (Brazil, Russia, India and China) economies will [illegible] the supremacy of the US and Europe by the middle of this century. The world [illegible] are finite – resource shortage of fuel, water and food will [illegible] as the [illegible] population expands and become increasingly urbanized with [illegible] population bases. Climate change remains controversial but [illegible] extremes and changing patterns. All of these global challenges [illegible] can [illegible] inter-state conflict or inter-state conflict and cause [illegible] upon our security.

[illegible] contributing our effort and with great success on the [illegible] control of [illegible]. Whilst this essential skill set has been a driving force in RN [illegible] we must not limit our horizons. As we look to these future [illegible] equally for infectious and tropical disease, including novel [illegible] medicine to manage the impact of novel weapons and to [illegible] range of medical specialties will be needed by the next [illegible] the RNMS. We must also explore how and where evolving technology and [illegible] will continue to alter the way in which we practise Naval medicine.

[illegible] but [illegible] these shorter term [illegible] distant challenges. I am mindful of the importance of the identity and ethos of the Royal Naval Medical Service and its [illegible] attention in an era when our numbers have slowly declined in recent decades and may continue so to do. Currently recruiting and retention are buoyant and we undoubtedly employ the best of the best but must strive to retain this advantage. I am absolutely committed to a single RNMS team, wholly inclusive of dental medical medical services officers and other ranks with a single ambition and ethos to deliver naval medicine to the best of our collective ability and drawing upon each other's strengths.

[illegible] have but one establishment which comes wholly under the umbrella of the Royal Naval Medical Service, the Institute of Naval Medicine. I have been talking with the [illegible] of the Royal Naval Medical Service (Surgeon Commodore Noel Bevan) and the [illegible] Officer in Charge of the INM (Surgeon Captain David Brown) about how to build [illegible] a high reputation and to identify the establishment more closely as 'The [illegible] Naval Medicine', an identifiable alma mater where we can focus the personal [illegible] of the RNMS as much as to harness its outstanding research capability.

[illegible] enough for now. There are great challenges ahead but [illegible] exciting times and I look forward during my tenure of this fine office to [illegible] the members of the RNMS to take these issues forwards.

[illegible]

Editorial

One of the privileges of editing this journal is ready access [illegible] articles of which I have regular opportunity to browse [illegible] associate themselves. Although technology has [illegible] from our past and there are many [illegible] staff today. I make no apologies for the [illegible] our service through the foundation of [illegible] medical struggles of the first MDG(N)s which [illegible] medical assistants in Afghanistan today and [illegible] are educated in secondary care. On [illegible] without doubt the most common disability [illegible] Afghanistan and this was highlighted by [illegible] Journal symposium summary of which is also [illegible] involves ongoing work in this area which [illegible] life [illegible] conditions as mental and physical [illegible]

MDG(N) has been vociferous in his support for the journal [illegible] recent articles in the pipeline to fill the next few editions [illegible] much broader all encompassing way ahead to [illegible] although, as with the rest of the Defence community [illegible] emerge from the inevitable painful defence review.

The journal is currently run on a shoe string with the [illegible] Audrey Willcocks and our long suffering treasurer [illegible] editorial committee that I am striving to reenvigorate. [illegible] owe apologies to Adrian Mellor et al for not [illegible] journal had inadvertently appeared in that [illegible] called [illegible] the last edition (see Errata). Offers of help [illegible]

David Brown

Clinical

Resting and exercising cardiorespiratory variables and acute mountain sickness

T J Hooper D Z H Levett, A J Mellor, M P W Grocott

Abstract

Introduction The incidence of Acute Mountain Sickness (AMS) is increasing. In a military context our current operational areas include mountainous regions with the implications of AMS including loss of operational tempo and logistical overstretch. Oxygen saturation and heart rate variability have in some studies been predictive of AMS while in others not. No single factor has been demonstrated consistently to be predictive of developing AMS.

Methods During an expedition to climb Mt Aconcagua (6959m) we explored the relationship between cardiorespiratory variables and AMS. In 11 subjects we measured simple physiological variables and Lake Louise Score both pre and post a standardised exercise challenge at on arrival at different altitudes and after a period of acclimatization.

Results The changes in cardiorespiratory variables we observed with altitude were consistent with previous studies. Heart rate respiratory rate and blood pressure increased whilst oxygen saturation reduced. Over time at altitude respiratory rate and heart rate were maintained whilst there was a reduction in blood pressure towards sea level values. Oxygen saturations improved over time at altitude and the change in heart rate on exercise was reduced with acclimatization. In this small pilot study individuals with AMS may have a greater heart rate response to exercise than non AMS subjects and this may warrant further investigation.

Conclusions The incidence of AMS in our study was low reflecting a conservative ascent profile. Further larger studies are necessary to fully assess the predictive value of cardiorespiratory variables in AMS.

Introduction

Acute Mountain Sickness (AMS) has been defined by the Lake Louise Consensus Group as the presence of headache in an unacclimatized person who has recently arrived at an altitude above 2500m plus one or more of the following: gastrointestinal symptoms, insomnia, dizziness and lassitude or fatigue (1). It is uncommon at altitudes of less than 2500m becoming more common above 3500m, especially in those who have rapid ascent profiles. The incidence of AMS has been quoted as 22% at altitudes of between 1850 - 2750m (2) and 42% at altitudes of 3000m (3) rising to as high as 60% in those ascending to 4500m(4). The incidence is increasing with millions of people travelling to high altitude each year for both work and leisure especially skiing. In a military context our current operational areas include mountainous regions well above 2000m (50% of Afghanistan is above 2000m) with the implications of AMS including loss of operational tempo and logistical overstretch. The ability to predict AMS would allow the identification of individuals at high risk and implementation of prevention strategies.

Environmental risk factors such as rate of ascent, altitude reached and sleeping altitude are well documented and can be modified to prevent AMS (5). However individual physiological risk factors are less well understood. A number of factors have been identified as being associated with or predictive of AMS including age (2,6,7)

gender (2 6) peripheral oxygen saturations (SpO2) (8) and heart rate variability (8). Adults over the age of 50 are less susceptible to AMS (2 6 7) while the incidence in children and young adults is substantial (9). Men and women are equally prone to AMS although women are less susceptible to High Altitude Pulmonary Oedema (HAPE) (2 6). Peripheral oxygen saturations used to estimate arterial oxygen saturation (on) have been associated with AMS with lower saturations in the AMS groups (8). In one study resting SpO2 at 4200m predicted the subsequent incidence of AMS during further ascent (10). However other studies have reported conflicting results (11). Several studies have reported that cardiac responses (heart rate variability) to hypoxic exercise in the laboratory are predictive of AMS in the field (12 13). However a more recent study reported that heart rate variability in exercise was not predictive of AMS (8). This study did replicate the finding that SpO2 values at high altitude were predictive of AMS and reported that the inclusion of blood lactate levels improved the ability of SpO2 to predict AMS. Factors which have been excluded as predictors of AMS include sea level aerobic fitness, coronary heart disease and mild chronic obstructive pulmonary disease (5). The hypoxic ventilatory response (HVR) although initially thought to be a possible predictor of AMS has subsequently been shown in a number of studies not to be related to AMS (14-18).

In summary it is apparent that no single factor has been demonstrated consistently to be predictive of developing AMS. The picture is further confused by apparently conflicting evidence in the literature. These inconsistencies may be explained by variations in study design, for example, some studies were performed in laboratories using altitude chambers and relatively acute hypoxic exposures which may not replicate the conditions in the field (8). In order to further explore the relationship between cardiorespiratory variables and AMS we studied the response to a standard sea level exercise challenge (the CXE Step Test) during an expedition to climb Mt Aconcagua (6959m) [illegible] these were related to the [illegible]

Materials and Methods

The protocol was approved by the University College London ethics committee (in accordance with the Declaration of Helsinki) and written informed consent was obtained from each subject.

Subjects

All members of a Tri-Service Defence Medical Services expedition to climb Mt Aconcagua in Argentina in January 2007 were recruited. No exclusion criteria were used. The expedition lasted 21 days with an initial ascent of Mt Vallecitos (5500m) for training and acclimatization followed by the ascent of Mt Aconcagua (6959m) via the Horcones Valley route. Data was collected throughout this period.

Symptoms Diary/Data Collection Book

Subject characteristics were collected for each team member (age, sex, weight, past medical history and medication).

A symptoms diary/data collection booklet was completed by each subject during the expedition every morning within 1 hour of waking before oral intake, exercise or cigarettes. For each day of the expedition (date, altitude, time, location, planned activity for the day, and medication/alcohol/cigarettes) were recorded along with the Lake Louise Score and physiological variables at rest and after an exercise challenge (the CXE Step Test).

Lake Louise Score

AMS was assessed using the Lake Louise Scoring system (LLS) (1). For each symptom (headache, gastrointestinal symptoms, fatigue/weakness, dizzy/light headedness, difficulty sleeping) a score of 0 to 3 was given. If the symptom was not present a score of 0 was given. If the symptom was present then a score of 1 to 3 was given depending on severity: mild – 1, moderate – 2 and severe – 3. AMS was defined as a LLS score of more than 3 with a headache (1).

Cardiopulmonary [illegible]
Heart rate [illegible]
[illegible]
[illegible]
[illegible]
rested to 5 [illegible] making more [illegible] to [illegible] oxygen saturation were measured using a finger pulse oximeter (Nonin Onyx 9500) on the right index finger. The data was recorded after 30 seconds of the probe being on the finger. Respiratory rate was measured by counting the number of breaths per minute and blood pressure was measured using a manual non-invasive analogue gauge blood pressure cuff with stethoscope over the brachial artery. All measurements were taken by an investigator and the subjects were blinded to the results during testing. The subject then performed the CXE step test (see below) and the measurements were repeated in the 60 seconds following the standardised exercise challenge.

Exercise Challenge

The CXE step test is a standardised reproducible exercise challenge. The subjects stepped on and off a 20cm step for 1 minute. The cadence was standardised to 1 complete step (both feet on ground to both feet back on ground) every 4 seconds (15 [illegible]). A investigator called the timing and recorded the physiological variables during and [illegible] following exercise.

Results

16 subjects were recruited. Data capture was incomplete for 5 subjects who were subsequently excluded from the analysis (2 symptom diaries were lost, 2 team members dropped out of the study and 1 member developed AMS early in the expedition on day 4 at 4250m and returned to a lower camp where data collection was unavailable). Baseline age, sex, weight, chronic medical conditions, drug history and the maximum altitude attained are recorded in Table 1.

Initial ascent was to 4250 metres over 4 days from Mendoza (750m) followed by descent to 2700 metres and re-ascent to 4300 metres on Day 9. All subjects followed an identical ascent profile during the initial 9 days but following arrival at 4300 metres ascent profiles diverged and data collection became less consistent. We analysed 11 subjects during the first 9 days (ascent and re-ascent). The ascent profile is illustrated in Figure 1.

The resting cardiorespiratory data is summarised in table 2. Following initial ascent from sea level to 4250m (Day 4), resting heart

Subject	Age	Weight/kg	Sex	Medical History	Medication	Altitude reached/m
1	34	97	M	Fit and well	Nil	6959
2	29	90	M	Hypertension untreated	Nil	6959
3	29	65	F	Fit and well	Nil	6959
4	34	100	M	Fit and well	Nil	6700
5	32	78	M	Fit and well	Nil	6700
6	56	90	M	NIDDM Hypertension	Nifedipine, Losartan Metformin Asprin	6200
7	28	85	M	Fit and well	Nil	5400
8	54	88	M	Fit and well	Nil	5400
9	34	62	F	Fit and well	Nil	5400
10	33	54	F	Fit and well	Nil	5400
11	29	64	F	Fit and well	Nil	5400

Table 1 Subject Characteristics and Maximum Altitude Reached

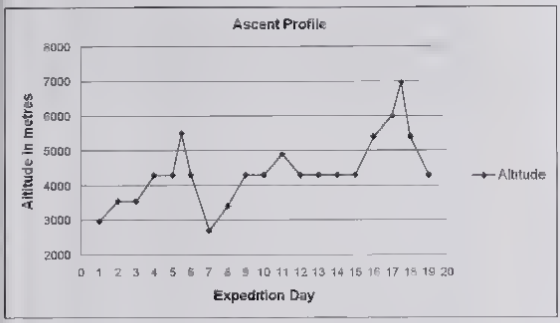

Fig 1 Expedition Ascent Profile

	Sea Level (Pre) Mean (sd)	2980m (Day 1)	3550m (Day 2)	4250m (Day 4)	0 vs 4250 (Paired t)	4300m (Day 9)	4250 vs 4300 (Paired t)
HR	64 (7 7)	80 (11 0)	82 (11 2)	82 (16 2)	0 005	94 (13 7)	0 018
SpO_2	98 (1 4)	91 (3 2)	89 (3 3)	84 (3 9)	0 000	86 (2 6)	0 129
RR	12 (1 3)	15 (3 2)	16 (2 9)	18 (4 1)	0 002	19 (3 3)	0 398
SBP	120 (15 2)	124 (14 8)	131 (19.4)	133 (14 1)	0 001	126 (13.0)	0 007
DBP	75 (11 8)	81 (8 7)	88 (14 3)	89 (12 8)	0 002	80 (10 5)	0 009

Table 2 Resting Cardiorespiratory Variables

rate (HR) respiratory rate (RR) systolic blood pressure (SBP) and diastolic blood pressure (DBP) increased whilst oxygen saturations (SpO2) decreased

Following further acclimatization and re-ascent to 4300m (Day 9) SBP and DBP were reduced compared with 4250m (Day 4) There was an increase in HR between 4250m (Day 4) and 4300m (Day 9)

Changes in HR RR SpO2 SBP and DBP following exercise at each altitude are summarised in table 3 HR and RR increased following exercise at sea level and at altitude whilst SpO2 SBP and DBP decreased The changes observed in all variables following exercise at 4250m (Day 4) were of a greater magnitude than at sea level After a period of further acclimatization the fall in SBP and DBP on exercise at 4250m was reduced and the heart rate increase on exercise was less

	Sea Level (Pre) Mean (sd)	2980m (Day 1)	3550m (Day 2)	4250m (Day 4)	4300m (Day 9)
ΔHR	-23 (18.1)	20 (19.1)	47 (17.0)	40 (17.2)	-2 (10.8)
ΔSaO_2	0 (0.6)	1 (4.4)	6 (4.5)	7 (4.1)	5 (3.0)
ΔRR	-5 (3.6)	3 (3.5)	-4 (3.0)	-7 (4.5)	-6 (3.2)
ΔSBP	39 (8.6)	35 (11.4)	44 (14.3)	53 (14.4)	39 (11.1)
ΔDBP	6 (5.0)	-8 (7.5)	1 (13.4)	9 (12.7)	-7 (11.6)

Table 3 Cardiorespiratory Variables after the Exercise Challenge

marked (25bpm vs 40 bpm). The fall in oxygen saturations and rise in respiratory rate did not significantly change between the first and second sojourn at 4250/4300m.

Incidence of AMS (LLS >3 with headache)

The incidence of AMS was zero at sea level rising to 4 at 4250m (Day 4). The incidence declined to 1 after acclimatization with re-ascent to 4300m (Day 9).

The mean LLS increased significantly between Sea Level (Baseline) and 4250m (day 4) and decreased significantly between the first ascent to 4250m (day 4) and the second ascent to 4250m (day 9).

Association of Cardiorespiratory Variables with AMS (LLS > 3 with headache)

Neither resting cardiorespiratory variables at 2980m or changes in these variables on exercise at 2980m distinguished between subjects who subsequently developed AMS and those who did not.

At 4250m subjects with AMS (LLS>3 with headache) had a greater increase in heart rate on exercise than non-AMS subjects. No other resting or exercising cardiorespiratory variable (HR, RR, SpO2, SBP, DBP) distinguished between AMS subjects and non-AMS subjects.

Discussion

Principal findings

The changes in cardiorespiratory variables we observed with altitude were consistent with previous reports (5,6,10,12,13,15). Heart rate, respiratory rate and blood pressure increased whilst oxygen saturation reduced. Over time at altitude elevations in respiratory rate and heart rate were maintained whilst there was a reduction in blood pressure towards sea level values. Increased ventilation with acclimatization (ventilatory acclimatization) led to a trend towards improved oxygen saturations over time at altitude. The change in heart rate on exercise was reduced with acclimatization.

The incidence of AMS in our study was low reflecting a conservative ascent profile. Although this was a prudent approach to acclimatization it limited the power of our study to detect associations between cardiorespiratory variables and AMS. From the limited data available it appears individuals with AMS may have a greater heart rate response to exercise than non-AMS subjects. However no variables or changes in variables measured at lower altitudes were able to predict subsequent AMS in this group.

The greater heart rate response to exercise in the AMS group is consistent with other studies that have looked at heart rate variability with exercise and altitude (12,13). However

our study did not find an association between oxygen saturations and AMS that has been seen in other studies (8-10). This agrees with the findings of one study that has not found an association (8) but could equally represent the low incidence of AMS and therefore the limited power of our study to detect a difference.

Strengths and limitations of the study

Many previous studies investigating physiological variables and AMS have used acute exposure to simulated altitude in a laboratory setting (8-12). Chamber studies may differ from the situation in the field and often do not permit observation of changes over prolonged periods of acclimatization (8). As a field study, we were able to assess acute changes with increasing altitude and changes over time at a similar altitude (4250/4300m) after further acclimatization.

We have demonstrated the feasibility of collecting simple physiological data in the field whilst still achieving a climbing goal. Compliance with data collection would have been improved with multiple sets of equipment. This would permit the continued monitoring of individuals who are forced to deviate from the team ascent profile – an important subgroup as these probably include those most susceptible to AMS. An important lesson is that where climbing goals have priority over scientific goals, data collection will suffer (e.g. due to divergent ascent profiles limiting comparison between groups).

Limitations of our study include the small number of subjects (this was a pilot study), the lack of complete datasets on all individuals, divergent ascent profiles (limiting intra-individual comparisons), the conservative ascent profile (reduced incidence of AMS) and the lack of data at high altitude (due to equipment shortages and focusing on the goal of summiting) where differences in the physiological variables between the AMS and non-AMS groups may have been greater.

Future studies should focus on larger groups to clarify the ability of changes in cardiorespiratory variables to predict the onset of AMS. The importance of a systematic study (same ascent profile [illegible] priority of scientific [illegible] emphasized daily [illegible] process if good [illegible] longitudinal field study [illegible] would be interesting [illegible] variables would be [illegible] incidence of AMS [illegible]

There is a [illegible] profile (for either [illegible] incidence of AMS [illegible] profile. The faster ascent [illegible] a higher incidence of AMS although [illegible] greater likelihood of identifying true differences between AMS sufferers and non-sufferers. It may also identify predictive patterns of cardiorespiratory variables which could have utility in identifying individuals who will go on to suffer from AMS. Clearly if a faster ascent profile is adopted then risk management and medical cover need to be of the highest quality.

Conclusion

A standardised exercise challenge and simple cardiorespiratory variables can be effectively collected at altitude. The heart rate response to exercise may be greater in individuals with AMS than those without AMS. Further data is necessary to fully assess the predictive value of cardiorespiratory variables in AMS.

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General

Making the European Working Time Directive work for you

A M Wood, N Clement, I M Wood

Introduction

Recently there has been much media coverage regarding the enforced reduction in working hours and the affect on Surgical Training. Currently, however, there appears to be no reversal in the decision to exclude surgeons from the European Working Time Directive despite a long standing objections and concerns about its effect on training(1). It is therefore important that as trainees and trainers we identify ways of maximising training opportunities within the working day.

Within most rotas there are periods of inactivity and periods not conducting training activities, we must remove as much of this "dead" time as possible in order to maximise training time at work. There has been much discussion regarding the potential employment of para-health professionals, such as the physician assistants(2,3) for service commitment work and so training the trainee to take advantage of training opportunities. It is essential that we use intelligent tasking of doctors in order not to lose valuable training time and maximize surgical exposure during our limited working hours (4).

Administrative Suggestions

In order to facilitate intelligent tasking it is necessary to understand all aspects of junior doctors day to day working commitments. At times this may be impossible for trainers to fully appreciate the many nuances of a rota which may have changed considerably from the "old style" 1 in 3 or similar rotas of yesteryear to a rota which involves working in shifts(5). Therefore we would encourage the involvement and advice of senior trainees who have recently worked the rota in question and may have a better idea of what could be saved by taking a proactive and intelligent lead on trainees' time.

Rotas and the associated issues of complicated beasts, and although training committees often have a useful role, representatives may be useful in specific to a representative who can indeed knowledge of rotas and how to maximise training opportunities. This will enable the training representative to concentrate on important issues and help in struggling with rotas which they may lack experience of.

Another way of maximising training is to ensure that trainees are fully involved in the creation of rotas. Unfortunately this is not the case in many hospitals. Frequently the responsibilities of rota co-ordinators have been devolved to a junior training grade or administrator. Unfortunately these individuals may see this as just another task to be completed rather than taking a personal interest in how to improve the rota for the department and training exposure.

The Problem

The main aim of maximising training is to increase the number of Consultant ward days (defined as time working with an allocated consultant) which is the most valuable to a trainee, than working with 5 different consultants on 5 different days. Unfortunately most surgical departments work 9 hour days starting at 0800 to 1700 as a basic day in which case 45 of the 48 hours are quickly used up in a normal working week. This means that after on-call commitments are

included the out-of-hours weekends 48 hours and as a result [illegible] days have to be rostered as an [illegible] reduction in consultant contractually [illegible] and the subsequent loss of training opportunities.

Some Easy Solutions

An initial starting point for saving hours is to look at your departments working practices. For example, do you have compulsory trainee teaching on an allocated afternoon? If you do consider starting teaching half an hour after your clinic finishes to allow time for natural breaks. If this is 13.00 and you teach for two hours then rota everyone apart from the on-call finish at 15.00 and you have already saved two hours a week.

In many hospitals clinics and some theatres are finished at around 16.00-16.30. If this is the case then it would be worth considering writing the rota to finish at 16.30 rather than 17.00, which when combined with [illegible] saved after teaching would give a best case working week of 41 hours rather than 45 hours. Most rotas will have enough buffers in them over a 52 week rota to allow for some clinics to over-run and the odd emergency to occur without breaking the sacred 48 hours.

Riddell hours are poorly understood but these hours compensate for doctors taking annual leave and having to provide prospective cover. These can turn a rota which is 48 hours on paper into a 48.5 hour rota and scuppered the best intended rota. Unfortunately there is not scope within most budgets to employ locums to cover annual leave, so effectively removing Riddell hours is not a realistic option. It is possible to reduce Riddell hours significantly by limiting the amount of hours covered on an [illegible] week. Therefore any on-call hours you can [illegible] have the double effect of reducing the number of extra hours and also the number of Riddell hours.

There are still some departments who have [illegible] to run a two tier on-call system. By identifying how busy trainees are during an on-call it may be possible to drop to a one tier on-call system in the morning, for example in Orthopaedics when referrals from Accident and Emergency are traditionally lower. If, for example your second on-call covers both tiers from 0800-1330 and your first on-call doctor comes in at 13.30-20.45 instead of having an on-call week of 89.25 hours you have an on-call week of 50.75 hours and a significant reduction in the number of Riddell Hours.

In smaller departments that only have a one tier on-call system it is not possible to reduce the on-call burden as above. This results in a number of zero hour days to compensate for nights and on-calls. Traditionally in many rotas these zero hours have been clumped together in weeks for ease, which results in people being away from the team for a week on nights and a week of payback.

Instead of a one size fits all approach, with a little time and effort it is possible to identify when a trainee's consultant is away and then roster the trainee to be away at a similar time. Likewise it is possible to pull a doctor on-call when the consultant is away. On a ten person (ten week) rota there may be up to ten zero hour days and ten on-calls excluding nights. If we assume that during a normal working week consultants are working with trainees 3 out of 5 days, then if the trainee has to take twenty days off during this time it means that in a rota cycle 12 (3/5ths of 20) consultant contact days are missed needlessly per cycle. Over a year this means that 62 consultant contact days are needlessly lost. Whilst it may not be possible to completely eradicate the number of consultant contact days lost, it is easily possible to reduce this by tailoring the rota to fit the individual trainee, ensuring they are away on non-contact days where possible, without impacting on team activity.

Study days are always a hotly contested subject, but regions who have designated teaching afternoons may consider organising a course locally over that day, which means that instead of losing a whole days study leave and a subsequent reduction in consultant contact days, there is only effectively a half day lost to study days.

Trainees can also help maintain their training hours by doing extra courses during their zero hour days, and rota co-ordinators should be encouraged to be flexible in moving zero hour days to facilitate trainees doing

external courses in their own time in order to maximise their training out-with that provided by their employer rather than wasting a good opportunity or having to take study days when they are meant to be training with their consultant

Examples of Rotas Before and After

By using this system it is possible to improve a rota as shown on Rota 1 below

This 10 person rota with an average of 46.9 hours with Rodell hours added (Which is the closest you can get to 48) There are only 31 normal working days per ten week cycle After accounting for annual leave and study leave this rota provides only 108 normal working [illegible] a week [illegible] Rota 2 has an [illegible] Rodell hours are [illegible] normal days a ten [illegible] annual leave and [illegible] 13 normal [illegible] average of 2.7 day[illegible]

This rota is compliant with the European Working Time Directive limit by 2.2 hours and allows some flexibility in the rota for occasional early starts or late finishes Staff could also potentially do an extra locum in the department once a month for waring list initiative lists etc without breaking EWTD guidelines

Doctor	Mon	Tues	Wed	Thurs	Fri (Teaching Pm)	Sat	Sun
1	0800 2045	0800 2045	0800 2045	08.00-17.00	20.30-09.00	20.30-0900	20.30-09.00
2	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	OFF	OFF
3	08.00 17.00	OFF	OFF	0800-2045	0800 2045	0800-2045	0800-2045
4	OFF	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	OFF	OFF
5	20.30 09.00	20.30-09.00	20.30-09.00	20.30-09.00	OFF	OFF	OFF
6	OFF	OFF	OFF	OFF	OFF	OFF	OFF
7	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	08.00-17.00	OFF	OFF
8	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	08.00-17.00	OFF	OFF
9	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	08.00-17.00	OFF	OFF
10	08.00 17.00	08.00 17.00	08.00 17.00	08.00 17.00	08.00-17.00	OFF	OFF

Rota 1

Doctor	Mon	Tues	Wed	Thurs	Fri (Teaching Pm)	Sat	Sun
1	13.30 2045	13.30 2045	13.30 2045	08.00-18.30	20.30-09.00	20.30-0900	20.30-09.00
2	08.00-16.30	08.00-16.30	08.00 18.30	08.00-18.30	08.00 15.00	OFF	OFF
3	08.00 16.30	08.00 18.30	08.00 16.30	13.30-2045	13.30-2045	1330-2045	13.30-2045
4	OFF	08.00 18.30	08.00 18.30	08.00 18.30	08.00 15.00	OFF	OFF
5	20.30 09.00	20.30 09.00	20.30 09.00	20.30-09.00	OFF	OFF	OFF
6	08.00 18.30	08.00 18.30	08.00 18.30	08.00 18.30	08.00 15.00	OFF	OFF
7	08.00 18.30	08.00 16.30	08.00-18.30	08.00 18.30	08.00 15.00	OFF	OFF
8	08.00 18.30	08.00 18.30	08.00-18.30	08.00 18.30	08.00 15.00	OFF	OFF
9	08.00 16.30	08.00 16.30	08.00-16.30	08.00 16.30	08.00 15.00	OFF	OFF
10	08.00 18.30	08.00 18.30	08.00 18.30	08.00 18.30	08.00 15.00	OFF	OFF

Rota 2

Discussion

The European Working T[illegible] stay for the foreseeable fut[illegible] adequate surgical training we will have to engineer and construct compliant rotas that allow service provision whilst maximising exposure to educational opportunities.

It is important to involve trainees in the development of rotas. Whilst no rota is perfect for the individual or the department with imagination and an intelligent tasking it is possible to create a rota which increases normal working days by 35% without compromising service provision.

Although not all departments have the luxury of a two tier system, there are still ways that training can be approved without disrupting service. In our first example, if we assume that during normal working days only one of 5 working days are consultant operating days, the original numbers look even worse with a resultant 71 consultant contact days a year. If intelligent tasking is used and on calls rostered when consultants away as well as days off, then it may be possible to increase this to 100 consultant days a year and still have a balanced rota, which would represent a 40% increase in consultant contact days. Likewise our second rota has 86 consultant contact days at year, and it may be possible to increase this to a maximum of 111 consultant days a year. I[illegible] intelligent tasking and placement of off days is applied.

Conclusion

As the European Working Time Directive appears here to stay, it is important that local training committees and national organisations like the BOTA and ASiT work with employers to ensure that rotas maximise training opportunities whilst still providing a service.

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General

The Role played by Royal Navy Medical Assistants on Operation Herrick 9. Can we do more to prepare them for future operations in Afghanistan?

D Ablett, L J Herbert, T Brogden

Introduction

The first ever independent review of the Defence Medical Services by the independent healthcare watchdog for England The Health Care Commission(1) was published in March 2009. This review was commissioned by the then Surgeon General Lieutenant General Louis Lillywhite and in it the trauma and rehabilitation services for military personnel hurt in battle were described as exemplary.

The review praised the care provided to casualties of war highlighting the ability to quickly reach and treat casualties innovations in the treatment of major injuries the training of staff design of field hospitals clinical audits to feed back important lessons and rehabilitation for injured personnel. The review took place during Operation Herrick 9.

Royal Navy Medical Assistants (MAs) played a vital role in the delivery of medical care to 3 Commando Brigade Royal Marines on the Herrick 9 Operation in Afghanistan (OpH9) from October 2008 to April 2009.

3 Commando Brigade is expected to deploy to Helmand Province Afghanistan on Operation Herrick 14 (OpH14) in 2011 and medical support should once again be provided by the Royal Naval Medical Services.

The training of MAs is longer than that of their peers in the Army and RAF. MAs initially undergo 6 weeks of basic training at HMS Raleigh(2). Twenty weeks are then spent at the Defence Medical Services Training Centre Keogh Barracks studying basic medical sciences medical administration and pharmacy. The next stage of training lasts 19 weeks and is mainly hospital based. It is during this that MAs are first exposed to a clinical environment. The practical work on the wards is reinforced with classroom teaching. The final stage of training consists of 3 months spent in a shore based RN Medical Centre consolidating learning and achieving competencies. Following completion of initial training MAs are posted across the Royal Navy at home and abroad.

MAs were posted from throughout the Royal Navy for OpH9. Some were from the Medical Squadron of Commando Logistic Regiment (CLR) and had spent several months involved in pre-deployment training. The majority however were augmentees who were drafted in to the Medical Squadron from other units shortly before deployment.

Certain pre-deployment training targets were set. These included attendance on the Battlefield Advanced Trauma Life Support (BATLS) course attendance at the 2 week Mission Rehearsal Exercise (one day of which was focused on medical training and used the Amputees in Action for role-play casualty scenarios) and attendance on HOSPEX (a hospital exercise the first few days of which focused on pre hospital care).

On OpH9 all MAs were rotated through different posts of varying intensity. The vast majority however worked at Forward Operating Bases (FOBs) Forward Aid Posts (

Patrol Bases (PBs) and on Combat Logistic Patrols (vehicle borne patrols). MAs based at FOBs and PBs regularly deployed on foot patrols with frontline troops. The role of the MA on any patrol is to provide care under fire and initial life saving treatment to casualties. When not on patrol, the role of the MA is to provide primary and emergency medical care to ISAF (International Security Assistance Force) troops, local nationals of all ages and ANSF (Afghan National Security Forces) personnel.

Aim

The aim of this study was to examine the roles that MAs had performed on OpH9 and to correlate this with their pre deployment experience and training.

We hoped to identify areas in which pre deployment training could be strengthened in order to ensure that an even higher level of care could be provided on OpH14.

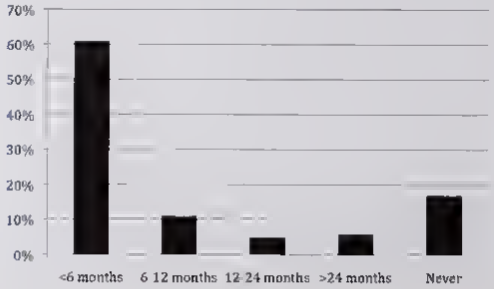
Methods

MAs were presented with an anonymity-protected questionnaire as part of their leaving routine from Camp Bastion in early April 2009 at the end of OpH9.

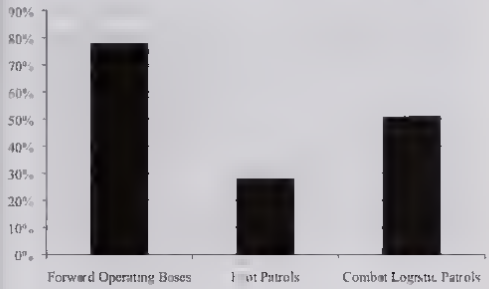
The questionnaire aimed firstly to identify the MAs seniority, gender, background, previous military experience and whether they were augmentees or not. It also asked about their previous medical training and experience, specifically with regards to paediatrics and trauma as well as establishing whether they had attended a recent BATLS course. Questions were also directed towards establishing the roles that MAs played on OpH9, the locations in which they worked, their exposure to treating trauma, paediatrics and primary care and their level of supervision by medical officers. The number and type of medical procedures that they performed were also quantified. Two free-text answers encouraged suggestions for possible improvements to pre-deployment training and any further comments.

Results

Of the 120 Royal Navy Medical Assistants who deployed on OpH9, 65 returned completed questionnaires. The results for this survey have been quantified using percentages of MAs based on those who completed questionnaires.



Graph 1 Bar chart illustrating the percentage of Medical Assistants who had attended the BATLS course within certain time intervals prior to deploying on Op H9



Graph 2 Bar Chart illustrating the percentage of Medical Assistants who performed high risk roles during OpH9

Personal Details
The vast majority of MAs (76%) were of the most junior rate of Medical Assistant (rate equivalent to private). 12% were Leading Medical Assistants (rate equivalent to corporal) and 12% were Petty Officer Medical Assistants (rate equivalent to sergeant). The male: female ratio was 12:10.

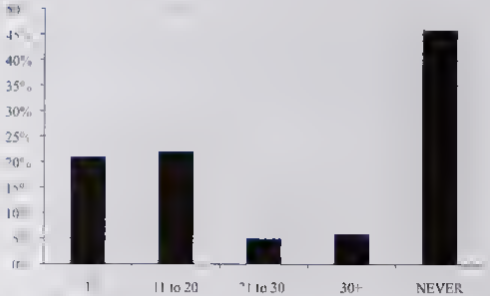
Background Experience
95% of the MAs came from general service backgrounds (i.e. had worked within Fleet). 3% were submariners and 2% were commando trained. 66% were augmented to Medical Squadron prior to deployment. 17% had served on a previous land operation and 55% had been on a land exercise before. Details of the number of medical assistants to have fulfilled the target of completing the Battlefield Advanced Trauma and Life Support (BATLS) course are illustrated in Graph 1.

Paediatric Training
89% of MAs had received less than 2 hours of paediatric training during their basic training. 86% of MAs had received less than 2 hours within the year preceding their deployment on OpH9 and only 3% had received more than 5 hours of paediatric training during this time.

Roles of MAs on Op Herrick 9
Medical Assistants on Op H9 performed a wide variety of medical duties. These included from administrative roles at Camp Bastion to foot patrols in highly kinetic areas of operations. The high risk roles where MAs were most likely to treat casualties included the following: foot patrols, Combat Logistic Patrols (vehicle borne patrols) and Forward Operating Base medical support. The percentage of MAs who performed these high risk duties is illustrated below in Graph 2.

Previous Clinical Experience
46% of MAs on OpH9 had never been involved in the treatment of a real life trauma casualty and only 21% of them had done so within the 10 months prior to deployment on OpH9. Graph 3 illustrates these findings in more detail. Further to this, 20% of all MAs questioned had not observed real life medical trauma management.

Adult Trauma management on Op Herrick 9
During OpH9, 86% of MAs were directly involved in the delivery of trauma care at the



Graph 3 [illegible] e percentage of Medical Assistants who had treated real life [illegible] emies (months) prior to deployment on OpH9

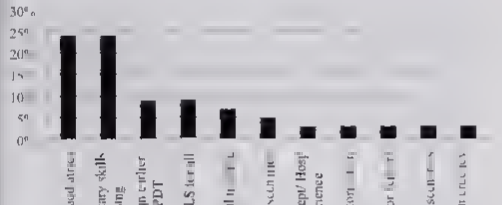
Airway Procedure	% Medics	Breathing Procedure	% Medics	Circulation Procedure	% Medics
Chin Lift/ Jaw Thrust	57	Ashermann's Chest Seal	32	IV Cannulation	75
Oral Pharyngeal Airway	38	Needle Decompression	11	EASY I O TM*	15
Nasal Pharyngeal Airway	35	Chest Drain	4.6	FAST TM*	12
Endotracheal Tube Insertion	3				
Tracheostomy	4.6				

***Table 1** The Percentage of Medical Assistants who used particular clinical procedures during real life trauma management on OpH9. * Intra osseous Cannulation Devices*

position of injury at Role 1 with 38% of them treating more than 10 trauma casualties during their 6-month operational tour. Table 1 shows which trauma care procedures were most commonly used during OpH9.

Paediatric Trauma management on Op Herrick 9
During OpH9, 62% of MAs were directly involved in the management of paediatric trauma with 9% managing more than 10 cases.

Primary Health Care on Op Herrick 9
All MAs were involved in primary care during OpH9 with 65% delivered primary health care in a setting that did not have a medical officer present. 55% were involved in delivering paediatric primary health care with 20% treating more than 6 cases.



Graph 4. Recommendations made by MAs for improvement in Pre-deployment Training for Land Operations

Recommendations for improvement

MAs were asked to identify areas in pre-deployment training for future land operations that they thought required improvement based on what they had experienced on OpH9. Graph 5 illustrates the most common recommendations made.

Discussion

The vast majority of the MAs questioned had a background in General Service and had not worked with 3 Commando Brigade before. Very few MAs were commando-trained and less than a fifth had been on a land deployment prior to OpH9. This was to be expected given that the majority of them were from general service backgrounds and of low seniority. Perhaps more surprising, however, is that prior to deployment on OpH9, 45% of the MAs had never been on a land exercise. Whilst on OpH9 many were involved in extremely hostile kinetic patrols that required a high level of infantry skill. The majority were augmentees and had received a shorter pre-deployment training package than those drafted to Medical Squadron prior to deployment.

The key pre-deployment target of attendance on a BATLS course was achieved by 83%, but 17% had never attended a BATLS course and of those that had, 26% had attended a course more than 6 months prior to the deployment. Augmentees had sometimes found it difficult to get time off from their units to attend a BATLS course as they could not be released due to the deleterious impact that their absence would have on medical service provision to their units.

The authors feel that whilst the BATLS course offers an excellent introduction to the principles of trauma care it must be re-enforced by real life, first hand experience or at least practice. Prior to OpH9 almost half of MAs had never treated a patient with injuries resulting from major trauma. Of those that had, only a fifth had done so within the previous 10 months and 20% of the total questioned had never even observed trauma care.

Almost 90% were involved in delivery of trauma care at remote locations during OpH9. It is therefore possible that on OpH9 that an MAs first ever exposure to treating trauma would have been when required to provide life saving care to a critically injured battlefield casualty at the point of wounding in a non permissive environment. Take into consideration the lack of previous land

[illegible] operations

[illegible] drafting of all deploying MAs to [illegible] Squadron a longer pre deployment [illegible] and ensuring that all MAs complete [illegible] within given timelines are certainly [illegible] consideration.

[illegible] for the approaching [illegible] deployment in 2011, the RNMS must [illegible] even better so that the [illegible] given [illegible] in the ISAF troops Afghan National Security forces and the local population of Afghanistan continues to deliver the highest possible standard.

Acknowledgements

The authors would like to thank Surg Capt F Thompson RN (CO UK JF Med Gp on OpH9) [illegible] support of this project and POMA D Pearce RN for his help in the data capture.

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General

Commentary on Medical Assistant preparation for role in Afghanistan

Surgeon Captain A S Hughes

As Navy Command commences the detailed work necessary to generate the Joint Medical Gp for H14 (Apr 2011) the author s observat ons are t mely and wall taken There s no doubt that as an organisat on predom nantly cont gured for marit me med cal support that operat ng m the Land env ronment presents us with spec fic challenges sterkly rtlustrated by rhe rote of our frontline med-cs in Afghan stan Together w th develop ng our Command Team I see preparing our Rote 1 medrcs as our two biggest r sks on H14 Whrist both ssues were taken very serrously for H9 we intend to burld on that experrence (-ncorporating lessons dentified from all subsequent HERRICK deployments) m order to mrtrgate the rrsks even further thrs trme round It s worth observing that wh lst we angst about the lack of green skrlls m our blue beret MAs rt rs well acknowledged that they brrng more to the party m terms of the r broader cln cal skl ts – notrng that DNBI and not trauma makes up the bulk of the Role 1 medrc workload Wh lst the Army medrc may have better honed nfantry drlls the wrdespread use of CMT2s has hrghlrghted gaps m therr ab l ty to deliver the necessery level of care in rsolated locat ons and rs something the Army are seek ng to address?

Leavrng paedratrrcs and mr tary sk lls as de for the monrent I am heartened by Graph 4 of the paper wh ch nrdrcates that >90% of the MAs questroned felt that they were adequarely prepared for thc r deptoyment mclucling pre hosprtat care and BATLS tramning Th s seems at varrance wrth the arrthor s mptred v ew elsewhere m the paper rhat nd enoug pe ple [illegible] trra ned The heat e lrca o s [illegible] respondents [illegible] rot kn [illegible] remerrbered tt at o the [illegible] HERRICK n ancower fanle [illegible] MA only 75% or Ireep [illegible] PJHQ ro requre BATLS t [illegible] rt tte rcmarder a c e t n e [illegible] wer o ore wo k ras sparr [illegible] nrder med eal off er srpe [illegible] H1 trra ned [illegible] excess of [illegible] can conrdeptly say rl at [illegible] ery MA frt rr [illegible] of the h ghe [illegible] was n date for BATLS th s was also carefully managed n Theatre by the Con mand team durmg perrods of R&R surge ope ar ons and the nevrtable trmes when personnel nad to be moved around The e s of course an rssue about how cur erri an nd v dual needs to be to manage tra ma b t ecogn s ng this the currency rules for BATLS changed from three years to two years dur ng rhe t me of the H9 deployment

Nearly 25% of the H9 respondents stared that they felt more paed atr cs and more m ltary sk lls tra n ng we e warranted Turn ng to paed atr cs the gap is well recogr sed across the DMS Th s s bemo addressed w th n the nurs ng cadre r ow rhrough addr onal tra n ng attachments ar d work s ongong w fhm the JMC to del ver n Level One paed atr c knowledge e learn no package for all DMS cln cal personnel as well as Level Two and Leve Three paedratr c tra n ng for certa n deploying personnel rarfored o ther operat ng environmenr The green sk lts observatron s also fully supported One of the key lessons

for the RN tron [illegible]
a more robust Me[illegible]
earlier in order to pla[illegible]
delivery of special fo[illegible]
collective training. W[illegible]

up the core elements for this team in June 2010 giving us the necessary manpower and lead time to deliver a targeted training package (with suitable validation) for those that will need these skills.

Surgeon Captain A S Hu[illegible]
DACOs Medical Ope[illegible]

Royal Naval Medical Service 2010; 96(1): 25-33

General

A modern approach to noise induced hearing loss in military operations

D C Brown and R S Milner

Introduction

On 7th December 2009 at University College Londons Ear Institute "A Modern Approach to Noise Induced Hearing Loss from Military Operations" brought together interested parties from the armed forces, the NHS, academic research and the voluntary sector to share and update knowledge of the science relevant to noise induced hearing loss and the practical problems faced during military operations.

Background

In 2006, due to increasing concerns regarding hearing loss resulting from operational noise exposure both from anecdotal reports and evidence from basic epidemiological surveys, Surgeon General (SG) mandated the chair of the Tri Service Specialty Board Occupational Medicine (TSSBOM) to set up a Defence Hearing Working Group (DHWG) to formally investigate and address the issue of hearing loss across lines of military activity, especially the current operational environment. The current Chair of TSSBOM and DHWG is Surgeon Captain Brown, the Medical Officer in Charge of The Institute of Naval Medicine (INM). A specific area of concern for all parties is the smooth transition of healthcare for service personnel when they leave service and their healthcare reverts to the National Health Service (NHS).

The Symposium

The symposium was opened by Deafness Research UK Chief Executive Vivienne Michael who stated: "We are delighted to be working in partnership with the MoD to help identify and minimise the risk of deafness and associated hearing conditions and to offer practical advice and guidance based on the most up to date deafness research." This was followed by an introductory address by Mr Kevan Jones, Under Secretary of State and Minister for Veterans. The Minister said: "The support that our people receive when they are in theatre and we want to make sure that they can take full advantage of it, is what the MoD and charities such as Deafness Research UK provide." The Minister added that he acknowledged the achievements of the DHWG, whose members include a representative from Deafness Research UK. There was also participation from the United States (US) Department of Defense and US Veterans Administration. Presentations and discussion were focussed on key topics:

- Reviewing NIHL: Why Now?
- Aetiology of NIHL
- Limiting NIHL
- Management of NIHL

Abstracts from presentations are given below.

Reviewing NIHL: Why now?

Noise Induced Hearing Loss in the Ministry of Defence – role of Defence Hearing Working Group

Surgeon Captain David Brown OHP FFOM Royal Navy, Consultant in Occupational Medicine in the Royal Navy

"The issue of noise induced hearing loss as a result of military operations was recognised

In the [illegible] Warfare where [illegible] intensive [illegible] was noted [illegible] wool. Subsequently [illegible] control measures [illegible] protect on, thereby minimising the risk to service personnel. MOD made major efforts to comply with the Health and Safety at Work Act and subsequent Noise at Work Regulations and introduced comprehensive hearing protection programmes. Although weapon noise was long recognised and assessed as a hazard with Peak Exposure Levels well above 140dB it was able to be controlled by hearing protection. However after the increase in military activity in Afghanistan from 2006 onwards it became clear that individuals were returning from theatre with Noise Induced Hearing Loss. Urgent action was taken by Land Command to mitigate this risk and Surgeon General established the Defence Hearing Working Group to bring together all parties involved in the identification, prevention and management of noise induced hearing loss. Progress to date will be outlined and enlarged upon in subsequent presentations.

Operational Perspective

Col W Bramble AD PERS OPS Chairman of the Army Hearing Working Group

Context

- Deployability of Army. Army manning has a proportion that is either Non Deployable or limited deployable. Including reference to those Soldiers employed on tasks.
- Casualty figures. Cover the current level of casualty figures in order to understand that Hearing Loss (HL) is part of the wider casualty management activity.

Occupational and Environmental Context

- Magnitude of Problem. After HERRICK 6 (Apr 06) HQLF received indication that HL was a problem generated on ops. This coincided with the work by SG and the US on their Fallujah experiences. The resulting early analysis of available audiometry showed the average infantry battalion HL was approx 6% of held strength. Those infantry battalions returning from Afghanistan (AFG) on HERRICK 6 showed HL statistics of up to 14% of held strength.
- Health Surveillance/ Audiometry. The requirement is set by JSP 346 for medical occasions (pre employment screening routine PULHHEEMS occasions for medical problems and when leaving the service). Audiometry requirements due to Noise at Work regulations are contained in Army Hearing Conservation Programme which set bi annual (every 2 yrs) audiometry requirement with increased frequency for those at higher risk. As a result of these early indicators from troops returning from AFG it was decided in Jun 08 that annual audiometry for all personnel would occur. Furthermore all personnel deploying on operations to AFG must have a pre deployment audiogram within 6 months of deploying and a post deployment audiogram within 6 months of returning from ops.
- Operational Experiences. Operational experiences since Falkland Islands (Balkans, GRANBY, TELIC) have not exposed HL as a significant issue due to the nature of conflict and operating environment.
- AFG Operational Environment. However nature of conflict in AFG, which is significantly different has shown that the in service Hearing protection systems particularly for those engaged in dismounted close combat were ergonomically and functionally sub optimal. Critically the imperative to utilise all your senses to maximise situational awareness whilst engaged in dismounted close combat in complex terrain and fighting a counter insurgency operation forced many to make a stark choice of retaining situational awareness (including maintaining radio communications and verbal orders) as a short term life

preservation essential subordinating the risk of HL to worry about if you were lucky enough to live to retirement. Furthermore the nature of counter insurgency (COIN) operations and particularly in AFG is such that there are very practical reasons why Hearing protection may not be worn at the critical moment and when you are least expecting it.

- Formation of the Army Hearing Working Group. Met on 1 May 08 with aim to identify HL problems provide a single army focus for HL and link into the Defence Hearing Working Group. The tasks of the AHWG are to understand the problem review and develop policy, issue direction improve Health Promotion through education and culture change. Finally the Personal Interfaced Hearing Protection system which you will hear about later was brought into service as a result of the AHWG catalysing efforts.
- Conclusion. There has been much progress in terms of policy development. Health surveillance and monitoring. Health promotion and culture change as well as new equipment for those deploying on operations. Prevention and early identification remain the best way of approaching the issue of Hearing Loss. However consequence management remains a key area that we are focused on in order to address those with Hearing Loss.

The extent of operational noise-induced hearing loss

Surg Cdr C Pearson MBA MA FRCS (ORL) RN - Defence Consultant Adviser in ORL

A diagnosis of noise-induced hearing loss requires a history of exposure to sufficient noise and audiometric evidence of a high frequency hearing loss of the appropriate configuration. Whereas exposure in industry may be assessed relatively simply, sporadic exposure to very high levels of noise generated by weapons means that this is not the case in the operational environment. In the Service hearing conservation programme it is therefore necessary to place greater reliance upon individuals audiograms.

Newspaper reports in 2008 [illegible] between 5% and 10% of troops [illegible] non-deployable due to NIHL on [illegible] operations but audit of the [illegible] shows that this was so in only [illegible] cases.

Comparison of pre and post [illegible] audiometry in 100 Reserve pe[illegible] deployed in Op Herrick 6 showed [illegible] had a definite deterioration in their [illegible] a further 32% had a measurable [illegible].

Of 181 Royal Marine 42 CDO [illegible] deployed in Op Herrick 9 69% had audiograms that were consistent with NIHL. Both the proportion of affected individuals overall and the proportion who were affected to a greater extent was significantly greater than a baseline study of RAF personnel that was undertaken prior to Op Herrick and Telic.

Aetiology of NIHL

Introduction to the ear, hearing and the effect of noise

Prof David Kemp, Emeritus Professor of Auditory Biophysics at University College London and Founder and Director of Otodynamics Ltd

The ear is a sensitive and delicate mechanism normally able to respond to ear drum movements smaller than the size of an atom. Today's researchers access powerful techniques which can help us visualise the intricate mechanism of the ear at work. Much more than just a microphone, the ear is an energetic machine able to manipulate, amplify and analyse sound energy on a nanometre scale before it is passed to the brain.

It's long been known that intense or persistent noise can permanently elevate hearing sensitivity but the exact location and nature of this damage was unclear. Today we know that it is the energetic engines of the ear – the outer hair cells – which suffer most from the physical and biological stresses induced by noise. They become deactivated and eventually die causing a thousand fold loss in hearing sensitivity. We can record the progression of this damage with

[illegible]

Tinnitus – Gain, Pain and the Brain

Professor David McAlpine – Professor of Auditory Neuroscience and Director of the Ear Institute

Cochlear damage can trigger the development of central hyperactivity but the underlying mechanisms remain elusive. Physiological studies indicate that the perception of tinnitus is linked to aberrant spontaneous activity (hyperactivity) of neurons in the central auditory system. Tinnitus-related hyperactivity has been found in the dorsal cochlear nucleus, the inferior colliculus, the auditory cortex and recently also in the inferior colliculus. Computational modelling indicates that activity stabilisation through homeostatic plasticity could explain the development of hyperactivity and tinnitus. This presentation will describe some of the possible causes and consequences of tinnitus, including the possibility that noise induced hearing loss not detected by conventional audiometry, can elicit tinnitus symptoms. Mechanisms contributing to the tinnitus percept may be related to normal brain mechanisms that control sensory gain. This outcome can be likened to phantom limb pain, where the absence of sensory input is compensated for by modifications of the neural representation of the damaged or missing limb.

Research into NIHL

Mr Kurt Yankensas – US Office of Naval Research

The presentation referred to the high incidence of noise induced hearing loss in DoD personnel with 3.7% of US Navy personnel showing a Permanent Threshold Shift and poor compliance with hearing protection. There is evidence of poor performance in response to operational commands by those with hearing loss. This issue represents over 16% of Claims for Benefit from the Veterans Administration with 9% for Tinnitus and 7% for hearing loss. There are major problems with the Naval environment particularly with flight deck personnel on carriers, 24/7 and impulse noise.

ONR's current research programme includes investments in the following areas:

- Bioterapeutics and Susceptibility including research into prevention through biomarkers, mechanisms of injury and effects of noise use of antioxidants, enzymes, anti-cell death and cochlear hair cell regeneration
- Investment in hearing aids and cochlear implants
- Medical technologies, signal processing in cochlear implants and drug delivery
- Evaluation and training- measuring susceptibility predicting loss, evaluation of interventions and training tools
- Noise reduction
- Protective equipment including 3D ear canal digitisation for custom sized ear plugs, in ear dosimetry, noise cancellation and communications

The long term aims are to reduce VA claims by 90% and improve hearing protection and communication systems. Perceived benefits include establishment of the mechanisms of tinnitus and NIHL and the impact of 24/7 exposure, the development of standards for impulse noise and 24/7 noise and suitable PPE for service personnel enabling appropriate communications, talk through, 3D audio and noise reduction.

Limiting NIHL

Lieutenant Colonel SEF Folkes – Consultant Occupational Physician Army Medical Directorate

Service life exposes personnel to many occupational hazards that differ from the civilian environment in the non operational environment the risk of these hazards causing harm can be addressed and have been reduced to the lowest practicable level to meet and in many cases better than that which is required

by the [illegible]
environment [illegible] hazards increase, [illegible] hearing loss

The principle of protection to all occupational [illegible] also apply to noise exposure in military. The principles of military exposure are laid out in a number of policy documents JSP 375 2006DIN07-008 Implementation of Noise and Vibration at Work Regulations 2005 and in the Army this is further interpreted in the and Forces Standing Order 3303 Land Forces Hearing Conservation Policy

Non-deployable Environment key identification of potential noise hazards this is undertaken by line managers and unit safety officers Areas to cover are identification of potential noise hazards identify persons at risk arrange for a noise assessment reduction of risk provision of appropriate hearing protection ensure arrangements are made for health surveillance hearing protection zones education monitoring noise control measures and consultations including Unit Health Committees

Operational and Overseas training exercises personnel are exposed to a wide variety of potentially damaging noise sources that cannot always be identified and managed As part of the health force protection measures each operation and exercise has specific measures and hearing protection measures outlined in the mounting instructions Where possible the options must be taken to taken to ensure the use of hearing protection when predictable noise exposure is planned e.g. wearing hearing protection when transiting in an aircraft or armoured vehicles

Education

- Extensive work has been undertaken over the last year to develop additional hearing protection education material
- Production of a 10 minute DVD Listen to Sense which is targeted at Service personnel in Initial Training but for use throughout a career to highlight the fact that hearing loss can be caused by operational contacts firing weapons operating machinery unprotected or listening to loud music Highlights hearing loss is progressive often painless and permanent and importantly will have significant effect on promotional chances and the ability to deploy on operations The DVD is supported with additional material to guide the presenter through the discuss on that should follow watching the film
- Supported by Commanders guide and individuals Guide as well as posters x 3
- There have been slots on Garrison radio complementing the Listen to Sense programme and it is covered at Regional Health Fairs
- Army Net open will also shortly have a Listen to Sense section with the educational material
- A 10 minute DVD Listen to Sense Protect Your Ears was shown to the audience

Screening

- Audiometry as Health surveillance is part of the Army Hearing Conservation Policy
- Frequency and means of testing grading and interpreting laid down in MOD policy and further supplemented by single service guidelines
- JSP 346 pre-employment screening and then SGPL 12/08 and 05/09 provide medical guidelines Army DGAMS policy letter 09/08 Health Surveillance for Noise at Work in the Army and specific employment groups have additional requirements e.g. aircrew
- Army now require audiometry to be undertaken pre-entry at Service PULHHEEMS annually and within 6 months prior and after operational deployment (this should full annual requirement on discharge or retirement and at the discretion of the clinician)

Hearing Protection Dismounted Infantry

Mrs Gillian Williams SE CESO ASE Noise DE&S Defence Equipment and Support

Mrs Williams discussed the background and range of equipment that MOD supplies to meet the requirement before going on to cover the MOD's work towards procuring equipment to meet changing needs of infantry soldiers

Potential for pharmacological intervention in noise induced hearing loss

Professor Andrew Forge
Centre for Auditory Research UCL Ear Institute

With the exception of intense blast noise which causes complete irreversible disruption of the sensory tissues of the cochlea the major cause of noise-induced hearing loss (NIHL) is the death of the sensory hair cells Once lost hair cells are not replaced so the consequent functional deficit – hearing impairment – is permanent. Understanding the biochemical pathways that lead to hair cell death and how they are triggered by noise has indicated possible means for pharmaceutical intervention to prevent or ameliorate hair cell loss One major trigger initiating the cell death programme is excess production of "free radicals" highly reactive forms of molecular species that breakdown cell components Noise exposure leads to free radical generation in the cochlea Some potential otoprotectants target specific components of the cell death pathway but these may difficult to deliver to the cochlea easily A number of different antioxidants which "scavenge" free radicals and neutralise them or enhance natural cellular scavenging systems have been suggested to reduce the extent of noise-induced hair cell loss Many of these chemicals are small molecules able to cross the physiological barrier between the blood supply and the cochlear fluids and thus potentially could be taken systemically However the doses required and for how long before and/or after exposure to traumatising conditions such dosing needs to continue are not known

Management of NIHL

Fitness for work and occupational rehabilitation for NIHL within the MOD

Lt Col L Holder
Consultant in OM since 1997 and responsible for advising SG since Oct 2008
Defence Medical Services Department

The presentation will cover

- Current UK hearing acuity grading system
- Linking this system to deployability on military operations
- A proposed future hearing acuity grading system
- Management of potential NIHL cases
- Looking at knowledge gaps (true prevalence consistency and quality monitoring of audiometry
- Opportunities to improve future knowledge – more research use of DMICP data

Integrating hearing and balance services vision, benefits and challenges for populations who serve in armed forces

Professor Adrian Davis BSc MSc PhD FFPH FSS O B E
Director MRC Hearing and Communications Group University of Manchester Director of the Newborn Hearing Screening Programme for England

There has been much debate about the extent to which noise exposure in young people affects their hearing in later life There has been no formal consensus but an agreement that noise especially the noise experienced by ex-service personnel is a major public health issue in later life that needs to be addressed Clearly prevention is best But prevention is only part of the major issue which is how those who have immediate or later impacts of noise get the best quality services to reduce the impact on activities that people normally need to do or enjoy doing The later impacts are usually dealt with reasonably effectively by the NHS but the age at which people realize there is a problem is often too late Recognition that ex service personnel are at raised risk of developing hearing problems needs to more widely disseminated and it is not unreasonable to think that a targeted screening programme would identify those with hearing problems that can be addressed by hearing rehabilitation would have substantial quality of life benefits These should be routine innovations that could be introduced if there was a governance and funding stream agreed but do we need to think about equity as well? Beyond hearing loss the situation is more complex It is not

just hearing problems but [illegible] issues regarding tinnitus [illegible] impacts that noise and [illegible] The NHS is not the usually well equipped [illegible] look at these longer term more complex issues. How should I respond, what partnerships are necessary to improve current services and is there a need to establish a baseline for what NHS services service personnel are currently receiving for these problems?

US Experience

Stephen Faustr PhD, Director National Center for Rehabilitative Auditory Research (NCRAR)

- Auditory dysfunction is the most prevalent service-connected disorder
- One in four service members returning from OEF/OIF conflicts complains of hearing loss and/or tinnitus (Fallon, 2006)
- As the Veteran population ages, hearing loss will become more prevalent and more Veterans will require rehabilitation
- Effective hearing loss prevention strategies must be implemented in order to reduce the financial and personal costs of auditory disabilities
- For the veteran, the most relevant cost is the reduction in readiness for life

Closing summary and audience feedback

Prof Mark Haggard
FMedSci HMFPHM HFRCSEd CBE
Honorary Vice President Deafness Research UK

It is hardly possible to provide a comprehensive summary of a diverse meeting such as this in a few minutes or paragraphs. The 25 themes for carrying forward which I identified in a process that was open to input from others during the day) covered 6 main areas. The first of these areas could even be considered as four: policy compliance, education and incentives, technology, diagnostic assessment standards, and managing consequences of NIHL. I took from the meeting an impressive intention to move on as rapidly as possible that is from the recognition that Noise-induced Hearing Loss had not been a priority area for some 3 decades to a set of actions that would put appropriated technology and arrangements in place readily. This intention took the form of a willingness to identify problems, share and learn. I can perhaps do no better than illustrate these six areas with one example each, adding under that this represents less than a quarter of the issues which I listed, and more like an eighth if the more specific categories of suggestion from subsequent audience feedback are furthermore included.

In the context of policy and compliance, the Army video alerting soldiers to the consequences of hearing loss was well received by those to whom I was new, and judged an appropriate motivational support for the wearing of hearing protection where possible. It appealed reasonably enough to aims of the ability to work, the enjoyment of social life and the avoidance of marital discord. However it was raised in discussion that not all these themes will appeal to all categories of personnel, age being a main factor. There may be more to be discovered by qualitative research about the most influential themes for particular sets of people, accordingly a profitable stratification into 2 or even more versions for differing target audiences, but calling on all the original footage, might be appropriate. Under diagnosis and assessment, the issue was raised as to whether a single diagnosis of NIHL is useful. Attributions to noise always involve a balance of probabilities as other factors are hard to rule out. So in an Armed Forces context would not an impairment measure and a comprehensive history leading to the relative strength of exposure to noise relative to exposure to other possible causes not be more useful? This is an essentially administrative but answerable question.

The issue of field (rather late-stage, after laboratory performance testing) evaluation of equipment arose in more than one context. Clearly opportunities for such intermediate testing become squeezed by pressures to get

better equip [illegible]
There has been a [illegible] T[illegible]
are also many limits to the ability to
accommodate R&D in theatre of war. But are we convinced that the right overall strategic chain exists between laboratory testing simulated field conditions including performance and acceptability through a variety of methods and systematic solicitation of feedback from early users that may optimise the instructions for use and in due course lead to further improvements? An obvious but not unique example is the new personal hearing protector built into communications equipment. Under the heading of evidence gaps many suggestions were made for epidemiological research on NIHL with in the military for aspects that should not be overlooked genetics nutrition extra military noise exposure and more refined measurement. Indeed in such a multi causal phenomenon omission of any of these aspects improves the analysis of any specific one that may be in focus through confounding or unnecessary measurement error. However it was widely recognised that progress had to be made in basic administrative systems that would capture health data on personnel in sufficient quantity and quality for it to become worth adding specific bolt-on measures from a research budget. The need for improvement embraces comprehensiveness of pre operational and post-operational checks completeness of follow-up and long term traceability of individuals who have left the armed forces. An epidemiological study with routine data and its management improved in such ways could serve many research questions. The escalating number of blast injuries makes a detailed study of their presentation and sequelae including the correlation of auditory with other injuries an urgent priority.

Fitness for employment already has an assessment system that has been revised within recent years but it remains rough-and-ready needing to capture all the main organ systems (eyes limbs etc) as well as hearing and it is not based upon the idea of continuous monitoring of readiness for battle. The idea of some single measurement technique or questionnaire that serves all purposes in a domain such as hearing has long had its day and any discussion of appropriate measurement must state the specific aim and context. In close-combat roles wearing of hearing protection may be impractical or even dangerous. We do not question this verdict from front-line troops and the Army video on protection uses the point well. By the same principle some mild early hearing losses must be considered similarly dangerous and would justify redeployment away from the front line, with the possible added benefit of preventing further damage in the most susceptible individuals. There is not an accepted standard for the maximum impairment with presumed combat noise cause that is permitted nor for this aspect of fitness for duty. Standards always pose challenges. The existence of any evidence base achievement of consensus and time-limited development via commissioned further work and appropriate measurement. Pure tone audiometry (PTA) is an important core assessment technique in all diagnosis and epidemiology which chiefly quantifies gross degree of impairment. However new screening techniques which do not quantify impairment but detect minor departures from normality for high frequencies where they most typically occur could be as good as PTA for this specific purpose of confirming hearing normal enough for close-combat roles.

Under the final heading of managing consequences the meeting may have been prescient. There has since been a ministerial announcement by the Department of Health of an initiative with full MoD involvement, to improve the transition to care by the NHS and the service given by the NHS to former service personnel generally. There is now a consultation period over details of implementation and the Department has declared itself open to suggestions such as those that emerged at the meeting.

The feedback from the audience was analysed as a whole nor stratifying on military versus non military respondents. It was favourable concerning achievement of the main declared aims of the meeting and usefulness

to part c pants [illegible]
thr e types [illegible]
spread awa [illegible]
poss ble change [illegible]
follow ng and so [illegible]
meet ngs (both w [illegible] MoD and [illegible] w dely)
and fc) spec fic stra gnforward ssues that can
and should be worked up or act oned n the
ear future Examples would be (a) workshops
o nclude MoD ev lrin personnel n promoting
existing policy for hear ng protect on (b) trials
of drug prevention and therapy (for wh ch there
rs some prel m nary ev dence) and (c) the
improvement of techn que quality and data
linkage of assessments within the existing
medical serv ce arrangements It s
character st c of such consultat on that a top c
may not receive the correct class f cat on
n t ally eg t may raise more profound ssues
than al first s emed so mplementat on m ght
be premature An extended meet ng of the
[illegible] ed Forces Hear ng Group s to be organ sed
shortly to take look at th s class f cat on and
take forward several of the latter

[illegible] accessible [illegible] following website

http://www defenceresearch org uk/Charities%20praised%20by%20Minister%20for%20Veterans+5508 lwl

Summary

The sympos um successfully brought together key military medical and personnel managers with c vilan experts n hear ng disorders and charities to help streamline our knowledge of the aet ology nvestigat on prevention and management of NIHL A req rement for seamless medical care for veterans with NIHL was recogn sed and collaborative work has commenced

Related read ng

ACOS Med Policy Letter 02/09 Requirement for Pre/Post Deployment Aud ograms for Op Herr [illegible]

D C Brown and R S Milner
Inst tute of Naval Med c ne

J Royal Naval Medical Service 2010 96 1 34-44

History

200 Years of 'Legging It' – A comparison of amputation surgery in 1805 to 2005

T Stevenson

From the time that man first waged war upon & begun to wound & kill his fellow men he has been ready to avail himself of all the knowledge & skill that could be obtained to save & cure"
W H Flower 1859(1)

An Introduction

Amputation is the oldest capital operation in existence and has been practiced since Neolithic times for punitive therapeutic and ritualistic reasons for many thousands of years(2). This paper reviews the indications contraindications surgical procedure morbidity and mortality rehabilitation and prosthesis associated with amputation particularly in the Naval theatre of war around 1805 and compared with the modern world of medicine and surgery of today.

Amputations Of The Past 1805 (Or Thereabouts!)

The first and foremost consideration of conducting amputation during this time was that the patient would be wide awake and fully aware of the procedure being done to them. This meant that all operations needed to be carried out as swiftly and as (relatively) painlessly as possible. After the discovery and subsequent implementation of general anaesthesia time became a luxury of which the surgeon could take full advantage.

Amputation was extremely common place two hundred years ago. Many sources discuss amputation as though it was the most routinely performed procedure by surgeons for example surgeon John Haddy James wrote a book about the causes of mortality after amputations in 1850 and in its states. More than thirty years experience has enabled me to collect an extensive record of operations of all classes and among them amputations of course form a considerable proportion (3). His use of the words of course implies that he expects the reader to know that amputations indeed made up a large proportion of operations at that time. With regard to the navy a source charting the history of surgery at sea concludes "it was common practice to hack off broken or wounded limbs with merry abandon" (4). This may be an exaggerated however when faced with no hospital facilities little room or time allowed for a patient to languish in bed to recover perhaps it is understandable that the navy surgeon would just remove the limb and be done with it enabling the man to be ready for duty or replacement as soon as possible.

Indications

The operations were performed on patients who were wide awake and carried a substantial risk of haemorrhage infection both resulting in death. It was also not unheard of for patients to die of shock during the procedure(5). However with these risks well known the operation would still be carried out.

The main indications were trauma and disease. In cases of trauma where fractures occurred the standard management particularly in open fractures was amputation at the joint above where the injury had occurred. The thinking behind this practice was to prevent infection of the open bone and subsequent generalised sepsis leading to almost certain death. Crush injuries and in the case of military casualties gun shot wounds lacerations from swords and bayonets and cannon ball injuries

all required [illegible]
that no at[illegible]
was not th[illegible]
Sea Surge[illegible]
called. The S[illegible]
discouraged [illegible]
over forwardness doth often [illegible]
good. (6) His idea of management [illegible]
argued against at the time, makes more [illegible]
by today's standard. Nothing cureth fractured
bone so much as rest. (7) Indeed amputations
were considered by many surgeons the last
possible option and done in order to
preserve life.

The trauma expected in civilian life
comprised crush injuries and lacerations from
wagons and mills and fractures from falls. John
James' book on the mortality of amputation
[illegible] clearly sums up the traumatic
[illegible] amputations according to each limb

[illegible] → gun shot wound, laceration
by mills
[illegible] → laceration and crush
[illegible] → wagon crush, mines
exploding, jumping (falls)
[illegible] → wagon crush, mines
exploding, jumping (8)

Other reasons for amputation would be battle
[illegible] in a although in bad weather accidents
were common. The following table contains
information from surviving certificates
contained in the Chatham and Greenwich
chest. Navy Pensioners boards responsible for
issuing pensions certificates to injured sailors

Date	Sailor/Age/Rank	Ship	Injury	Action
22/11/1801	Joshua Blight 24 Able Seaman	HMS Thistle	Lost right eye off coast of Egypt	Nil
01/04/1805	Michael Morris 26 Able Seaman	HMS Jason	Assumed fractures of the face, neck, arms, hands, legs & feet by explosion of a magazine whilst taking & spiking 6 guns in an enemy battery	No amputation recorded. Developed ulcer at the wrist
19/02/1807	Charles Kellett 34 – Landsman	HMS Royal George	Injury of 2nd finger of right hand due to a splinter in action of Sir Thomas Duckworth in passing the Dardanelles	Ulceration of wound led to amputation above the 1st Finger joint
13/08/1807	Owen Hughes 25 Ordinary Seaman	HMS Bellerophon	Crush of the big toe of the right foot	Toenail fell off so amputated at the 1st joint
30/07/1810	Robert Daniels – 34 Sergeant, Royal Marines	HMS Euryalus	Gun shot wound in right fore arm after cutting out a French vessel near Toulon	Amputated above the elbow
10/10/1810	Henry Hanlen 28 Quarter Gunner	HMS Victory	Fell from beams into the waist, causing violent concussion of the brain whilst getting foresail ready to be sent off	Nil
24/11/1810	William Thompson – 35 Able Seaman	HMS Blake	Hurt left foot by unguarded falling shot, fracturing metatarsal bones at Copenhagen whilst conveying along main deck to wash seamens clothes	No action taken although wound has caused seamen great distress
10/06/1811	John Tuffnell 33 Able Seaman	HMS Iris	Chime of cask damaged tendons of the 1st & 2nd fingers of right hand whilst doing as Captain of the Hold employed & was fully sober.	Fingers went to sleep & afterwards sailor underwent amputation

Table 1 Pensioners Certificates from the Chatham Chest & Greenwich Chest (9)

The amputations performed are highlighted in bold just to draw attention to the fact that of this random sample of sick certificates four (possibly five) out of eight cases underwent major amputation for their injuries.

The other major indication for amputation on land, at sea and at home was disease. Inflammatory diseases were not always well described two hundred years ago and where [illegible] notes have described amputations in these [illegible] they refer to 'Disease Process' or [illegible]. The assumption that by 'Disease' [illegible] they are referring to what we now call [illegible] vascular disease, ulceration, the [illegible] consequences of Diabetes Mellitus, Tuberculosis [illegible] untreated malignancy. By infection [illegible] intended to refer to *Mortification* or [illegible] due to disruption of the blood flow [illegible] which was common both in injury, disease and following surgery. Sepsis was almost always inevitable in civilian trauma injuries, especially in cities as the streets were often lined with horse dung and thus home to many forms of bacteria available to enter a wound site following say a wagon wheel crush injury or compound fracture(10).

Contra Indications

There were very few contra indications to amputate two hundred years ago and the only debate was when to amputate. Many surgeons would argue that primary amputation conducted immediately at the time of injury led to the greatest success. Others argued that delaying for as long as possible and thus performing secondary amputation was advantageous.

Many believed in amputating without hesitation because of the detriment to the body [illegible] injury could cause. For example a [illegible] surgeon in his day John Atkins [illegible] wrote a book 'The Navy Surgeon' and [illegible] amputation during battle '[illegible] the heat [illegible] is a sedative factor makes it the properest [illegible] for amputation, men meeting their [illegible] fortune with greater strength and resolution than when they have spent a night under thought and reflection (11) suggesting that a man steeled for battle would be able to use his own red mist to withstand the horror of losing a limb to the surgeons blade. Other surgeons such as John Hunter liked to wait for several hours until the first inflammation had passed (12) as did surgeon John James.

Secondary amputations in civil practice and performed under favourable circumstances were and are on the whole attended with less mortality than primary (13). Finally there were surgeons who would remain undecided and hence found themselves in a dilemma, such a military surgeon John Bell. When there is a question about amputating in a very bad compound fracture, the question is whether the patient will consent to lose the leg at once or risk the dangers of immediate gangrene and death? (14) The-e is difficulty in finding reliable statistics to see which argument may be correct however a senior naval surgeon by the name of Alexander Hutchinson decided to settle the argument once and for all following the battle of Algiers 1816. He circulated questionnaires to the surgeons of the fleet regarding the number and nature of wounds requiring amputation, duration of delay before amputation, mortality rate and period of survival. His results showed surgeons who practiced immediate amputation dealt successfully with more serious injuries and conducted more amputations per patient with a mortality rate of 33.3% significantly lower than where amputation was delayed (45.8%). Whilst today's epidemiologists may criticise his study it won many of his contemporaries over and Hutchinson went on to make important recommendations for further reduction of mortality following amputation(15).

A converse view was given by surgeon Stephen Hammick in 1830 who wrote of an occasion where he had a patient whose limb was prepared for amputation, however the patient's physician would not allow it, fearing for the patients life, which overruled both the surgeon and the patients desire for the operation to go ahead. The patient survived and the limb eventually healed, but the patient spent five years in bed recovering and was utterly miserable and never regained full mobility(16).

The only other contra indication I could discover was where the patient was beyond saving, so palliative measures were taken to ensure as much comfort was given as

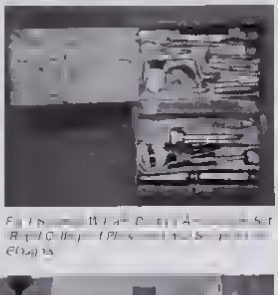
[illegible] pos sibl rath er than putt in [illegible] agony of ar an putat on ha [illegible] the dense se as reco nited [illegible] he the pare nt des w t [illegible] conscious of some r oparat [illegible] the p n ta ces alt ough [illegible] m ajority of surgeons were [illegible] been liberal w th the adr [illegible] part cularly opium (lauda [illegible] passing of the stricken pa [illegible]

Surgical Procedure

Notes taken by an anonymous student o May 6th 1814 on a lecture about amputation delivered by a Mr Cooper (probably Samuel Cooper) g ve gu dance on the procedure

Make your inc s on below the patella 8 inches from patella the poster or & a [illegible] T b al artery requ re ty ng Keep the t mb [illegible] after amputat on (18)

To take a step back let us look ev ew t conditions in wh ch operat ons wo ld take place The surgeon of old would typ cally perfo m amputations at the patient s home [illegible] n the case of th [illegible] at sea As a co se t [illegible] for own nstuntes s [illegible] t [illegible] ct es m ght have acce [illegible] a g theat e o [illegible]



F [illegible] Collection (Photo [illegible] 2005)

F [illegible]

The s[illegible] far less luxu[illegible] T[illegible] condit[illegible] described by navy surgeon Tobias S[illegible] his assumed autobiography Roderick Random where he writes of after being press-ganged into the HMS Thunder what awaited him in the sick bay about fifty miserable distempered wretches huddled one upon another and deprived of the light of day as well as of fresh air breathing nothing but a noisome atmosphere of the morbid streams exhaling from their own excrements and diseased bodies devoured with vermin parched in the filth that surrounded them (19)

William Turnbull famous surgeon and former navy surgeon wrote a handbook for navy surgeons in 1806 and in it definitively covered everything the young surgeon would need to know about amputation He began with the instruments

[illegible]	[illegible] tracheotomy
[illegible] with parts [illegible]	[illegible] pair of scissors
[illegible]	[illegible] scalpel
[illegible]	[illegible] elevator
[illegible]	[illegible] brush
[illegible]	[illegible] probes
[illegible]	[illegible] silver catheters
[illegible]	[illegible] case of gum lancets
[illegible]	[illegible] dissecting forceps in a case
[illegible]	[illegible] scalpels
[illegible]	[illegible] head of razor
[illegible]	[illegible] key of the instrument
[illegible]	[illegible] gum lancet
[illegible]	[illegible]
[illegible]	[illegible] probes
[illegible]	[illegible] splints
[illegible]	[illegible] set of jointed, for legs
[illegible]	[illegible] thigh
[illegible]	[illegible] rollers
[illegible]	[illegible] bandages
[illegible]	[illegible] pewter syringes
[illegible]	[illegible] set pocket instruments
[illegible]	[illegible] lancets in a case

Table 2 – A list of instruments according to the New Regulations for navy surgeons(20)

With regard to the procedure Turnbull wrote of 4 main steps to bear in mind

The first [step] is the prevention of haemorrhage by a full command of the [illegible] quet and a minute applicat on of the tenaculum afterwards The second important step is the separation of the nerves in order to prevent the symptoms of pain & spasm The third important step is the proportion of the stump which should be no more than completely to cover the denuded parts and not so much as to lap over and endanger the formation of matter The last circumstance regards the after treatment and here the great object is to obviate inflammation and afterwards to check any excess of discharge which might reduce the constitution of the patient (21)

The following paragraph describes amputation of a hand written by surgeon William Northcote

For amputation of the hand three assistants placed thus One should stand behind him [the patient] to hold the body another on the side of the affected arm which he is to hold fast a third assistant must hold the hand about to be amputated Then proceed to fix the tourniquet with a compress on the brachial artery [The skin is pulled taught and surgery begins] Having divided the skin older the same [second] assistant to draw it up as much as possible then cut through the flesh to the bones circularly close to the edge of the retracted skin & divide the intermediate skin and ligament between the bones by the cutting with which we also separate the periosteum a little both from the radius & ulnar to prevent its being lacerated by the teeth of the saw which we must next apply on the outer side of the arm ordering the assistant to draw up the flesh as much as possible to open a passage to the bones that they may be cut off a little higher than the incision and that the flesh may afterwards wrap over them and thus the flesh and skin being longer than the bone and folding over the stump with greatly hasten the cure Work the saw upon the both bones after they have been partly entered by the teeth and cut through them as speedily as possible but be

[illegible] retu[illegible] same time w[illegible] thus an pu[illegible] little the to[illegible] blood the [illegible] discovered [illegible] by ligature with a crooked [illegible] thread made pretty broad to prevent from cutting through the coats of the artery which is thus intercepted by passing the needle twice round and securing the ligature by the surgeons knot (22)

once [illegible] divided as few strokes as possible [illegible] the nearer you come through the easier to move lest the bones should splinter (23)

From these two accounts one can see a big [illegible] in how to conduct the operation. And from both accounts we can also draw the conclusion that the surgeon's biggest worry was haemorrhage. This was assisted considerably by the introduction of Petit's screw tourniquet.

Fig 3 Right Arm Amputation – A surgeon with his assistants bracing the patient

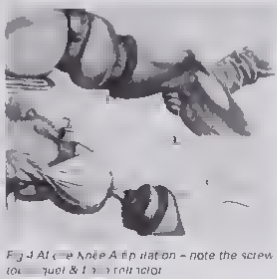


Fig 4 Above Knee Amputation – note the screw tourniquet & [illegible] tourniquet

This detailed account seems to hold true to the same principles used today and to demonstrate similar procedure for another limb, the following is a generalised method with which to conduct an amputation at any level from John Atkins, The Navy Surgeon.

In this operation the first thing we ought to have in intention is the stopping of the blood. There are 3 methods in practice, the 1st by medicines astringent or styptick, the 2nd by cauteries actual or potential, & the 3rd by a deligation of the artery. The trinkets put in & twisted to a degree sufficient to check or interrupt the course & motion of the blood. Guidet [illegible] knife [illegible] circumcision, bringing it at once as near the bone as you can, & as far round, also you are to separate the flesh and clean it to the saw. The saw is to be set on both sides at

Morbidity & Mortality

A[illegible] already seen, was a [illegible] the mortality was [illegible] Much depended on [illegible] pyaemia(25). Other causes were [illegible] gangrene and tetanus often found in [illegible] manure on the streets and so able to easily enter traumatic wounds. Unfortunately [illegible]

difficult to f[illegible] the different causes of death at [illegible] are a series of tables documenting the mortality rates following amputation in hospitals

So here out of 300 cases performed by one surgeon over 33 years 43 died (approx 14%) with amputations at the thigh providing the larger death rate and amputation at the fore arm the lowest

A far more severe death rate occurred in Paris at 65% Presumably the conditions of the hospital had an effect on whether or not the patient would develop sepsis or gangrene

Or perhaps the varying death rates came from surgeons idiosyncrasies for example an American Surgeon Samuel Gross would touch his knife on the sole of his boot and then [illegible] for the whole operation Sponges would be re used between operations merely dipped in water if soaked in blood or dropped on the floor surgeons would happily wear their aprons which were stiff with blood without ever washing them (a stiff apron was the sign of a good surgeon) and in one case attributed to Robert Liston where in his haste to remove a leg he also removed the patients testicles two fingers from an assistant and the coat tails of an observer The observer promptly dropped dead of shock fearing he had been cut The patient and assistant both went on to develop gangrene and both died so it became the only operation on record with a 300% mortality rate(26)

Figures at sea for mortality were just as variable Strangely the death rate due to infect on at the Battle of Trafalgar was only 10% Either the conditions were inhospitable for the growth of bacteria or perhaps the surgeons were being a little more conscientious about their cleanliness *[John]*

	Primary		Secondary		Disease	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Thigh	13	8	15	5	118	11
Leg	18	7	5	1	57	5
Arm	19	3	4	1	18	1
Fore-arm	18	0	2	0	13	1
Total	68	18	26	7	206	18

Table 3 – Devon & Exeter Hospital 1816 1849 Mortality rates of 300 amputations(26)

	Cases	Deaths
Thigh	44	34
Leg	67	42
Arm & Shoulder	36	2[illegible]
Fore-arm	10	2
Total	157	102

Table 4 – Extract of all Primary Amputations in Paris for Traumatic Lesion 1838 1846 (From Malgaigne) (27)

Atkins [illegible] *steps* [illegible] *(which* [illegible] *clean* [illegible] *water and* [illegible] *chosts as* [illegible] *clothes and a receptacle for* [illegible] *limbs* (29) Atkins mentor Jar[illegible] [illegible] senior surgeon at Plymouth also prac[illegible] extreme cleanliness which was said to be [illegible] key factor of his success

The varying mortality rates would continue to remain pretty high until the discovery of Joseph Lister's carbolic acid spray When this was implemented the morbidity and mortality rates of all operations not just amputation began to drop

Rehabilitation & Prostheses

The sailors of the Chatham Chest received a generous annual pension for their injuries But what was the future in store for an amputee? The stereotypical image of the peg-legged pirate was probably quite accurate Prostheses were simple wooden pegs or for the slightly wealthier a crafted wooden leg

The prostheses would depend on where the amputation had occurred With regard to post-operative pain it was considered much easier to fit a below-knee amputee with a comfortable prosthesis as recounted by Hammond *Let me urge you very strongly whenever you possibly can take off the limb below instead of above the joint its advantages are very great!* (30)

With regard to rehabilitation there is almost nothing in the literature It obviously had to happen somehow as so many people underwent amputations and there are plenty of accounts of how surgeons saw patients several years later when they were back to normal and pain free

Modern Day Amputations 2005 (Or Thereabouts!)

The first thing to say about amputations is how much less common it is than it used to be Approximately 5 500 amputations are performed annually across the entire UK with [illegible] patients being over 65 years [illegible] [illegible] men (2003-[illegible] [illegible] following trauma [illegible] [illegible] trend out now? [illegible] for amputation [illegible] Table 5

	percentage
[illegible]	85
[illegible]	10
[illegible]	5
[illegible]	<1

Table 5 – Main indications for amputation in the UK(32)

Amputation through the lower limb accounts for 85% of all amputations(33) Once of the main causes for all these amputations is diabetes Diabetics are 15 times more likely to suffer amputation than someone without

The indications for a below knee amputation are gangrene ischaemic ulcer advanced unreconstructible ischaemia acute or chronic infections (including osteomyelitis) severe enough to preclude healing at a distal level(34) These indications are perhaps not all that different to those in 1805 but we understand them a little better and are able to do more to prevent these conditions reaching the need for amputations

From a trauma perspective the standard managements of compound fractures is now reduction and fixation with every attempt made to restore 100% functionality to the limb Amputations still have their place for example severe crush injuries war injuries such as bomb blasts and mines and also severe burn injuries Most of the disease processes bring about the need for amputation surgery by affecting the circulation at whatever level as the figures suggested in table 5

Contra Indications

The universal contraindications for modern day amputation are gangrene ischaemia or infection of such severity as to preclude healing at the level of desired amputation(35)

[illegible]

Surgical Procedure

The procedure has changed very little from that used two hundred years ago. The main differences now lie with the conditions under which operations are conducted. For a start the discovery of anaesthesia and sterile techniques have offered an entirely different environment in which to operate and so have allowed the surgeon the opulence of as much time as he needs to operate. The typical amputee on ot say above the knee lasts about 20 minutes although is subject to lengthening if any complications arise during surgery.

Scrupulous cleanliness is now a must with surgeons and staff changing into clean clothes specific to the theatres and applying sterile gowns and gloves in which to conduct the operation to minimise the reduction in risk of infection.

With regard to anaesthetic amputation can be performed under general anaesthetic or in the cases of patients unfit for that spinal anaesthetic or epidural. So some patients are still awake just like two hundred years ago only now they cannot feel anything!

Morbidity and Mortality

For all the advancements made over the last two hundred years amputation still carries a substantial risk of morbidity and mortality following operation. Infection is still a relative problem with a recent study showing that limb amputation shows the highest rate of surgical site infection at 14.3% of cases compared to eight other categories of surgery(36).

A Norwegian study looked at morbidity and mortality of lower limb amputation and found that in 97 patients 122 amputations were performed including 45 above (AKA) and 77 below (BKA) knee amputations with a conversion rate from below to above knee amputation of 14%. In 65 of those patients (67 complications occurred (67%) the most frequent of wound infection was 10% in the BKA group and 2% in the AKA group and overall hospital mortality for BKA was 3% and for AKA 8%. Long term survival was 62% at 1 year 50% at 2 years and 29% at 5 years(37) showing a still high mortality figure.

Another major problem leading to high post-operative mortality is age. An American study looking at survival following lower limb amputation in an elderly population found that mortality risk increased with advanced age more proximal amputation level and renal and cardiovascular disease particularly after the 1st year(38).

Recommendations are now to provide special st care to patients with predictors of long term mortality and try and reduce figures in this way.

Rehabilitation and Prostheses

Aftercare of a modern western world this has been revolutionised over the last 200 years with patients able to expect a full multidisciplinary approach geared towards helping them adjust and adapt to life without limb. With dedicated orthotics and prostheses departments in hospitals at least 90% of patients with a transtibial amputation will successfully use prostheses in contrast to a success rate of 25% of geriatric transfemoral dysvascular amputees(39). The main factor to account for this difference is that there is a hugely increased energy requirement to walk on an above-knee prosthesis.

While they face the problems of stigma and embarrassment in public people without limbs today are well cared for and have a vast amount of opportunities open to them. So long as they are well provided for rehabilitation and prostheses for amputees will only improve in the future especially with the advancement of myoelectrics the computerised limbs that move on command.

Conclusion

Amputations were carried out [illegible] frequently in Napoleon[illegible] times [illegible] broader indications and although [illegible] has changed remarkably little [illegible] carried out far more swiftly. Pot[illegible] afforded good operative success [illegible] principal difference being in the [illegible] infection in the post operative [illegible].

As we are now into the 21st [illegible] can only expect further advances in [illegible] surgery, medicine and technology.

The asymmetric nature of the recent conflict in Afghanistan has shown that amputations still have a major place in a military environment and there is still the potential for it to face the Naval Surgeon a sea, be it in a conflict scenario or a trapped limb. However although the techniques are very similar, fortunately surgical conditions, facilities and the long term outcome have improved markedly.

Nonetheless when one considers the conditions at sea in Napoleon[illegible] times with [illegible] anaesthetics and the inevitability of post operative infection, the successes achieved [illegible] amputation were remarkable.

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Picture References

Fig 1 Courtesy of Mick Crumpin
Fig 2 Courtesy of Mick Crumpin
Fig 3 Courtesy of James Boston Royal College of Physicians & Surgeons of Glasgow
Fig 4 Courtesy of Lt Cdr J Server Commanding Officer HMS Victory

Special thanks to

- Mick Crumpin Honorary Curator Museum of the Royal College of Surgeons Lincoln Inn Fields London
- Tina Craig Library of the Royal College of Surgeons London
- Jane Wickenden Institute of Naval Medicine Alverstoke Gosport
- Staff & Crew HMS Victory HM Historic Dockyards Portsmouth
- Royal Naval Museum Library HM Historic Dockyards Portsmouth
- Archives & Manuscripts Wellcome Institute for Medicine London
- Mr Aaron Sweeney & Vascular Team Lewisham Hospital London

J Royal Naval Medical Service 2010 96 1 45 53

History

Watching over Jack: Alexander Bryson, 1802-1869

J V S Wickenden

Introduction

In an earlier article *Doing it by the book: what the books in the Historic Collections can tell us about naval medicine in the nineteenth century* [Wickenden 2007] the name of Alexander Bryson appears frequently as a source of information. All his books are held in the Historic Collections Library of the Institute of Naval Medicine and while cataloguing and reading them I found myself attracted to the style of his writing and the fearlessness of his invective.

I was also intrigued by the contrast between the man whose writing could express such passion this estimable gentleman according to the British Medical Journal [Hutchinson 1869] and the chilly nonentity who emerges from the brief article in the Oxford Dictionary of National Biography (ODNB). The present paper attempts accordingly a fuller assessment of Alexander Bryson trying to flesh out the story of a man who white no unsung hero certainly more unsung than heroic seems to have fallen into undeserved obliv[illegible] I am not medically trained and any medical errors are mine entirely.

Early life and career

Alexander Bryson was born on 5 April 1802 at Houston in Renfrewshire to James Bryson and Margaret Barr married since 1785. An older brother Robert was born in 1795 and the IGI (International Genealogical Index) records five other brothers of whom at least three died in infancy. Robert married in 1821 started a family and set up as a cotton broker in Glasgow with some success to judge by the increasing size of his household in the Scottish censuses [illegible] mions Mr Alexander Bryson [illegible] nally [illegible] the ODNB (M[illegible] 2008) [illegible] their [illegible] Edinburgh [illegible] Edinburgh University Royal College of Physicians [illegible] Royal College [illegible] [illegible] another Alexander Bryson [illegible] [illegible]

Alexander Duncan recounts that [illegible] educated in Glasgow and began [illegible] or that Faculty [illegible] the Royal College [illegible] (Duncan 1896) [illegible] 1821 matriculation album for Glasgow University. His older brother Robert was 30 in this year and it is tempting to think that he may have put up the money to pay the university's fees.

Bryson's studies entailed attendance at two courses of lectures on anatomy one in the practice of physic (i.e. medicine) one in chemistry one in materia medica and one in surgery with six months of hospital work and at least three months practical pharmacy. In 1827 Glasgow University awarded him an MD. He began his career in the Royal Navy early in the same year perhaps even before the award of his MD was formalised when on 13 February 1827 two months before his 25th birthday he joined the Royal Naval Hospital Haslar as a hospital mate.

Sea service

On 11 October he was appointed assistant surgeon to HMS Magnificent the receiving ship for Royal Naval Hospital Jamaica. He was aboard Magnificent for just over a year before being appointed assistant

Surgeon [illegible] 1829

After a [illegible] voyage home again on [illegible] ved on 27 May 1830 the first of [illegible] gs to the African station for duty [illegible] slavery squadron On 28 June [illegible] d [illegible] ectly from HMS Dryad (5th [illegible] (6th rate) on the [illegible] amic station Tr[illegible] ly a promotion as Bryson was [illegible] Surgeon which suggests [illegible] s own surgeon had died or been [illegible] Bryson's Medical Officer [illegible] voyage survives in the [illegible] Archives [illegible] according [illegible] ases of [illegible] weight loss [illegible] deposit [illegible] sneous stri[illegible] [illegible]

There are traces already [illegible] his journal or a [illegible] Brysonian prosa style [illegible] also of his very real sense [illegible] evident in the description of the effects of mercury too long to give in its entirety [illegible] of these being patients not an experiment on the other end of the medical procedure

[Who can say (mercury) is harmless that [illegible] is seen a patient [illegible] doomed to languish two [illegible] three or four weeks under its influence [illegible] It [illegible] to be hoped that the days of mercury [illegible] ed as a specific in inflammatory fever are [illegible] ing to an end [illegible] Unfortunately for [illegible] real science its most strenuous advocates [illegible] hitherto been unable to explain [illegible] to [illegible] the real nature of the benefits (sic) [illegible] expected from its use – nor can [illegible] ence its action

Bryson was more restrained than the [illegible] surgeon of that time when it came to [illegible] s parents *[venesection] is [illegible] of the greatest utility but only when employed with due regard to consequent debility. [illegible] do not ignore the latest drugs The sulphate of quinine [illegible] [is] of great benefit [sic] and materially assist[s] [illegible] in preventing debilitating paroxysms of fever*

Home again from Africa in May 1832 Bryson was posted in quick succession to two [illegible] rates HMS San Josef guard ship at Plymouth and HMS Castor at Chatham He [illegible] joined the new brig sloop Griffon at Chatham for a four year posting to the Cape of Good Hope and the West Africa station after which he was rewarded with promotion to surgeon and a four year stint in home waters with the paddle-sloop HMS Salamander at Woolwich

Convict ship surgeon

In 1841 he was off again for six months to the West Africa station in HMS Madagascar another 5th rate followed by a posting as Surgeon Superintendent aboard the Marquis of Hastings a convict ship bound for Hobart Town in what was then Van Diemens Land (Tasmania) Brysons Medical Officer's Journal for this voyage has also survived and can be consulted [ADM 101/50/6] At the end of the case studies is to be read

The following are part of a section of the Prisoners put under treatment according to the directions of the Inspector General Sir William Burnett [illegible] to try the relative effects of Lemon Juice Citric Acid and Nitrate of Potash in the cure of scurvy

James Lind's clinical trial on cures for scurvy aboard HMS Salisbury in 1747 is well known but this ninety five years later and forty seven years after lemon juice was made Admiralty issue Bryson labelled his three groups (nine men each) Divisions 1 2 and 3 and gave each group a different potential cure

By coincidence I had been contacted earlier in 2009 by Dr Katherine Foxhall of Manchester University Chapter 4 of her PhD thesis (Foxhall 2009) deals with precisely this subject I extract four quotations

1 *The renewed interest of the navy in testing various remedies for scurvy in the nineteenth century appear to stem from a report by Charles Cameron a convict ship surgeon who in 1829 described the almost miraculous effects of the efficacy of an old remedy first recommended by another naval surgeon in 1795 In this treatise Dr Paterson had described the extraordinary effect of a solution of nitre in common vinegar in restoring above eighty seamen from the scurvy The Admiralty enthusiastically received Cameron's report and proposed that two*

tons of nitrate of po[illegible] could be n future be supplied to [illegible] 00 men on convict ships. This see[illegible] s the an ongoing concern about [illegible] efficacy but it is important to the unnecessary expe[illegible] ng lemon juice at sea

2 *By the 1840s the perso[illegible] es scurvy that some surgeons had displayed developed into a cen[illegible] experiment on thousands of [illegible] convicts*

3 *Of the fifty-three convict surgeons that the Navy supplied with scurvy remedies between 1840 and 1844 eleven specifically reported their opinions and a further thirteen journals provided evidence of scurvy during the voyage*

4 *Surgeon McKecknie on the Layton felt there was little difference between citric acid and nitrate. Potass [but both were] preferable to Lime Juice. In contrast Bryson declared nitrate of potass objectionable*

As we now know lemon juice contains ascorbic (antiscorbutic) acid or vitamin C and does cure scurvy. Citric acid though present in large amounts in lemon juice is not the same nonetheless its appearence in the trial is not unreasonable. Nitrate of potash also potassium nitrate or KNO3 or saltpetre is in these days used to relieve angina but why it should have been considered as a potential cure for scurvy is a mystery. Possibly those men whom it appeared to help were suffering from blood pressure but it must have tasted revolting apart from anything else.

(It is only fair to add that Alexander Armstrong [Armstrong 1858 p 40] discussing the symptoms of scurvy wrote *The thoracic pains are much more frequent and severe and in a few cases which I attended symptoms of Angina Pectoris were present*.)

Bryson recorded that both lemon juice and citric acid had a positive effect on scorbutic symptoms lemon juice having the edge. Nitrate of potash [illegible] cure [illegible] was [illegible] conclusions [illegible] 1858 book [illegible] articles by Bryson [illegible] Armstrong etc. [illegible] 1858 p 101]

Between 3 July [illegible] when Bryson's service on the Marquis of Hastings ended and his next posting in [illegible] ary 1845 there is a longish gap [illegible] an usual. At that time naval surgeons were placed on half pay as soon as they were paid off (unlike army surgeons who were always on full pay) and a long gap could drain their finances considerably. In addition time on half pay did not count as time served towards promotion.

HMS Eclair and shore service

Bryson would have spent some of this time on the voyage home from Australia. En route perhaps for the first time he came across HMS Eclair. She had left England in April 1844 for anti slavery duty off West Africa by the time she returned to the waters off Southampton in September 1845 nearly half her crew had died of yellow fever more including her second replacement surgeon Sidney Bernard were still to die. The House of Commons Parliamentary Paper 125 March 1846 is a *Return of officers and men who volunteered to serve on board Her Majesty's Ship Eclair from the day the Yellow Fever broke out on board to the day the said Ship was paid off*. At the head of a list captioned The following officers volunteered but their services were not required is the name Alexander Bryson.

Perhaps because his voyage on the Marquis of Hastings had been both difficult and tough – the handwriting in his journal bears some witness to this – Bryson's next posting was the Royal Yacht William and Mary permanently based at Woolwich. During this posting he wrote his most important work *Report on the climate and diseases of the African station* [Bryson 1847] published in the year of his appointment to HMS Fisgard. Bryson was to remain officially attached to Fisgard a training ship for engineers and nominal depot ship for personnel ashore at

Woolwich [illegible]

[illegible] had a respect [illegible] apparently [illegible] sapphire [illegible] Bryson and Sir [illegible] Burnett were [illegible] Lanron [Pym 1849]. He may not have [illegible] the [illegible] posts [Bryson 1849] which [illegible] strains Bryson at his most biting. The [illegible]ess of his attacks to modern eyes [illegible] by Victorian style.

[illegible]volence is truly a noble attribute of [illegible] man mind, but it may be doubted [illegible] Williams was [illegible] under its [illegible]nos when he left [illegible] be a duty [illegible] to step forward in the [illegible] fairly and give to the world his [illegible]

[illegible] was [illegible] Pym's [illegible] [illegible] treated. The [illegible] was evidently a [illegible] of intensive [illegible] under [illegible] Although Pym [illegible] ranked him [illegible] reference of his [illegible] seems to have taken little account of that. This is hardly the Bryson of the ODNB, more interested in statistics than in the problems of naval surgeons, and surely too passionate to be dismissed as "cold and dry" [Mills 2004].

The 1850s too were busy years for Bryson. In 1853 comes the first mention in the Lancet as gathered from Capt. Pickering Pricks 1930s compilation [Prick 1932], where Bryson is noted as an examiner of naval medical candidates.

Deputy Inspector General and upward

On 1 March 1854, after a third posting to Fisgard as surgeon, Bryson was appointed Deputy Inspector General of naval hospitals. His duties consisted chiefly of preparing the Statistical Reports on the Health of the Navy. He was assistant to Sir William Burnett, Inspector General of Naval Hospitals and their working alone. The Health of the Navy was first published in 1856. It appeared annually until 1935 and afterwards less frequently. The two-year delay between Bryson's appointment and the appearance of the first volume may have been due to the outbreak of the Crimean War in 1854. In the same year Bryson published Extracts showing the prophylactic [illegible] of quinine to *Notes on diseases in Turkey and Memoir on the remittent fever of the Levant* (London: Stewart and Murray) remembering perhaps his earlier experiences aboard HMS Atholl.

He also compiled and wrote the report of the medical and statistical returns of the Baltic and Black Sea Fleets during the Crimean War [Great Britain Admiralty 1857]. While it covers the medical statistics of the Naval Brigade with habitual depth and thoroughness, it also gives Bryson a chance to show his affection for his comrades. "There is not, perhaps, any class of man so regardless of their lives as the thorough bred seamen of Her Majesty's navy, and it is difficult to make them believe that there is not something discreditable in crouching behind stone walls or parapets in the presence of an enemy."

In November 1859 he was gazetted as Honorary Physician to Her Majesty, in the same year he revised the *Manual of medicine and medical statistics for the Admiralty manual of scientific enquiry* and about this time also wrote *On the recent introduction of yellow fever into Port Royal, Jamaica* for the Transactions of the Epidemiological Society of London. This suggests that he was keeping a reminiscent eye on medical conditions at the scene of his first service abroad.

On the family front, also in 1859 his brother Roberts daughter, Margaret, who had married a Patrick Mitchell some years before, gave birth to a son. The baby was christened Alexander Bryson Mitchell, suggesting that there were still close links with the family back in Scotland.

The 1861 census records Alexander Bryson aged 58 Physician of Hospitals Royal Navy living in a house called The Hermitage at Barnes Also in the household are Helen Buck from Mortlake aged 57 the cook and Celia Hill housemaid from Bisley aged 19 and a visitor from Scotland his niece Mary brother Robert's younger daughter and sister to Margaret

At times the Health of the Navy volumes seem to have made little impact in November 1862 the Lancet records simply that Dr Bryson compiled a Blue Book giving brief details of a few statistics A record in The National Archives throws more light on the next move in his career 19 Jan 1864 Sir John Liddell bears strongest testimony to ability stating he knows no one so competent to fill the place of Director General – 21 Jan 1864 Appointed Director General of Medical Department for 6 years Sir John Liddell who recommended him was the previous incumbent of the post which Bryson in fact occupied for five years and a quarter

Maybe in response to this appointment the editor of the Lancet waxed lyrical quoting Thomas Dibdin and giving me the title for this article "Dibdin's sweet little cherub who watched over Jack is replaced by the more prosaic but less mythical Dr Bryson who keeps never failing watch over the sailors health and well-being" [Pick 1932] Even to the partial reader anything less cherubic than Alexander Bryson would be hard to imagine

In June 17 1865 the Lancet sited tot notes that several military officers who had never been engaged with the enemy have had the honour of knighthood conferred on them while the Medical Director General has only received the C B a glaring exhibition of degratory contrast [ ] We will accept this crumb of honour [but] will not relax our efforts on behalf of this important branch of the profession [Pick 1932]

Perhaps Sir John Liddell's assessment of Bryson's ability was wrong perhaps there is evidence in an as yet undiscovered source but the ODNB says firmly that Bryson was neither an efficient nor a popular director general [Mills 2004]

According to [illegible] Medical Journal he endeavoured to be honest and impartial in the distribution of his patronage His manners were blunt and he did not care to conceal his dislike of the self-conceit of those who entertained an inordinate estimate of themselves and their services [BMJ Such honesty does not lead to popularity as to efficiency there is as yet no evidence He was however extremely busy among other things replying to letters sent to him from surgeons all over the country requesting promotion or a post of any kind One garnered from Peter Davies comprehensive website on the Royal Navy during the lifetime of William Loney (1817 1898) surgeon RN will suffice

8 Cumberland St Pimlico SW
10th August 1865

Sir I beg respectfully to request that you will be pleased to place my name on your list of candidates for promotion to the rank of Deputy Inspector-General And while expressing my readiness to proceed on foreign service on promotion I should in the meantime be glad of any Staff employment at home in my present rank
I have the honor to be
Sir
Your most obedient Servt
Wm Loney
Staff Surgeon R N

Bryson replied the same day with letter no 2 351
Sir
I beg to acknowledge the receipt of your letter of this day's date requesting that your name may be placed on the list of candidates for promotion to the rank of Deputy Inspector General and a Staff Appointment at Home for the present
I am
Sir
Your humble Servant
A Bryson
Director General

Loney who was on half pay at the time

[illegible] Deputy Inspector General [illegible] be that year [illegible] Medical Officer at Haslar [illegible] Portsmouth [Davis 2009]

[illegible] responsible not only for [illegible] but also for the adjacent [illegible] The need again in the years [illegible] 1950 and 1870 [illegible] adequate [illegible] [illegible] the Navy. It is [illegible] Medical Journal of 1866 [illegible] on the [illegible] 1865 sounds like Bryson at work [illegible] he was certainly among the signatories [illegible] some indication of what the Board [illegible] against

The majority of those rejected were utterly ignorant of the Latin language, two failed altogether in Anatomy and Surgery, and two were so ignorant of Materia Medica that it would have been dangerous to have passed them as qualified. We are sorry to have to add that many of the manuscripts have given evidence of such ignorance of orthography and the most ordinary rules of English grammar and composition as could hardly have been credited in members of a liberal profession.

Later career and last years

In 1866 Bryson was involved with the Committee on the Position of the Medical Officers of the Army and Navy [Great Britain Parliament 1866], going into considerable detail over inequalities of rank, pay and position and the ensuing difficulties. In the Army at that time there was what the report calls "a natural feeling of disappointment on the part of the medical officers as to the non recognition of their relative rank", while a memorial from the Royal College of Physicians points out the "general and settled feeling of discontent with their position which prevails among the Medical Officers of the Navy", being regarded as "highly desirable that the medical services of the Army and Navy should be assimilated as closely as their relative nature will admit in rank, pay, position and retirement". One of the letters quoted respecting this memorial is from Dr Bryson and "the Committee are led to believe that independently of the personal and social discomforts which are inseparable from a seafaring life and which are especially experienced by young men on their first joining the naval service, the pecuniary and social advantages are in favour of the military service" [Great Britain Parliament 1866]. While it is not absolute evidence, I am inclined to believe that this shows Bryson to be more interested in the problems of naval surgeons than the ODIB would have us think. However, an editorial in The Lancet (September 29 1866) on Surgeon Captain Pick's compilation quotes The Army and Navy Gazette as saying that Dr Bryson is "expected back from leave shortly", which this suggests that the level of work he put into the report was not altogether recognised.

Next year, 1867, Glasgow's Faculty (now the Royal College) of Physicians and Surgeons thought highly enough of him to make him an Honorary Fellow, but that is the last real milestone in Alexander Bryson's active career. The end of this is difficult to account for, although in July and August of 1867 there was another "cause célèbre" in the news when one of the inspectors general was called upon to retire in "utter defiance of the new warrant" [Pick 1932]. This was Dr Stewart, the inspector general at RNH Stonehouse, whose retirement had been ordained three years before, due time in December 1867. It was announced that he would be able to hold his appointment until 1868, and on August 22 1868 the Lancet ran an editorial (transcribed by Capram Pick thus): "It may be from insuperable force of circumstances but the director general does not appear to stand by his subordinates. Take the case of Dr Stirling. Has the director-general formally protested or left any record that he has supported his junior officer? The editor quotes the case of a young assistant-surgeon who was appointed abroad, out of his turn, and on his complaining to the director-general the latter pleaded ignorance of all reasons why the navy cannot get surgeons." (I might add that this seems unlikely given the evidence already quoted.) The Lancet continues: "Dr

Bryson ca[illegible] age when retirement s[illegible] le – a rule which [illegible] public services [illegible]

This gives [illegible] all was rosy in the ga[illegible] Bryson's [illegible] when [illegible] the Narrow A[illegible] appointment [illegible] Lidell simply states placed [illegible] 15 April 1869 to [illegible] was earlier noted as "appointed for five years in 1864

On the other hand we read that to the Lancet for January 23 1869 the sudden resignation of Dr Bryson the Medical Director General" came as a surprise He will however continue to act until his successor is appointed The fact is that this officer has served the allotted five years and his age precludes him from taking on further official duties The editor speculates as to his successor" [Pick 1932]

The ODNB interprets all this as suddenly dismissed from his post in 1869 failed to receive the customary knighthood and spent his last months haggling over his pension" [Mills 2004] while Peter Davis writes on his William Loney website He resigned when without consulting him the Admiralty appointed a Civil Commission to enquire into the state of naval hospitals" [Davis 2009a]

Marks Rott the obituary publication of the Royal College of Physicians may be the source for both of these statements although he suggests that it was the Admiralty which did the haggling In fact is not not positive about its subjects personality Bryson's preoccupation with statistics and lack of hospital experience combined with his blunt manner and want of humanity unfitted him for the responsibilities of his high rank Nevertheless they did not justify the callous treatment accorded to him [illegible] his retirement in 1869 – refusal of the customary knighthood sudden dismissal the appointment of a civilian commission of enquiry without reference to him and haggling over his pension actions which bear a very final illness" [Brown 1955]

The commission to enquire into the efficiency and economical working of the Naval Hospital [illegible] the Lancet [illegible] dara of B[illegible] tative o[illegible] factor [illegible] April Sr 18[illegible] successi[illegible] has been [illegible] Medical Department [illegible] Bryson C[illegible] Armstrong [illegible] cited above will [illegible] successors conce[illegible] editor speculated [illegible] royalty and well know[illegible] begins to wonder wh[illegible] humble origins which block[illegible] knighthood of his own

A simpler answer may be that Bryson retired because he was aware of ill health closing in on him Only six months after his retirement he was "suddenly and more than usually indisposed" with what was probably the first of a succession of strokes On the afternoon of Friday 10 December the same year he was walking in the garden of The Hermitage when he complained of feeling very unwell He walked into the dining room went up stairs to his bedroom and returned – only to collapse unconscious Three local doctors cared for him over the weekend including his usual doctor Dr Willis of Barnes but he died on the Sunday morning 12 December 1869 without regaining consciousness He was sixty-seven

He had made or re-made his will on 7 July 1864 some months after his appointment as Director General of the Medical Department It reads as follows I leave to Mary Bryson daughter of my brother Robert Five hundred pounds All the rest of my effects of whatever kind I leave to Sarah Bryson daughter of my brother Robert Bryson It seems likely that by 1869 Sarah hitherto not found in the records had been at Barnes for some time perhaps acting as hostess in the absence of any Mrs Bryson (as Mary may have been doing when the census was taken in 1861) The sister Margaret was provided for by her marriage and presumably Robert's

sons were likewise [illegible] other lance from their father. It seems [illegible] how typical that Alexander Bryson [illegible] have taken care to look after those of [illegible] Jud family who were otherwise unprotected.

Obituaries appeared in [illegible] Lancet and the British Medical Journal in December 18. The Lancet [Walley 1869] takes [illegible] the same tone as the ODNB 130 years [illegible] ODNB's assessment of Bryson as [illegible] Medical Journal [Mills 2004] derives [illegible] from the British Medical Journal but [illegible] element of [illegible]. For what the British Medical Journal [illegible] Hutchinson [illegible] 1869 actually says about Alexander Bryson [illegible] with the conclusion [illegible] study of his work [illegible] he had himself reached [illegible] cancer a son-in-law, a cold [illegible] know [illegible] nonsense, a very kind heart and generous disposition.

Acknowledgements

This paper was originally presented in a slightly different form at the 'Securing the Ultimate Victory II' conference, Army Medical Services Museum, 15-17 April 2009 and in another version at the Aspects of the History of Naval Medicine Seminar held at the Institute of Naval Medicine on 26 November 09.

I must thank Captain David Brown, MOIC at INM, who kindly made a brief period of sabbatical available to me for research, Bruno Pappalardo of the National Archives for assistance, Jenny Wright, the Admiralty Librarian, for kindly checking the Navy List, the archivists of the universities and Royal Colleges of Physicians and Surgeons in both Edinburgh and Glasgow for checking their records, Dr Katherine Foxhall for kindly allowing me to quote from her thesis, and not least my friend Rosemary Coates, who got bitten by the bug and sat up till four in the morning looking for Alexander Brysons parents.

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NB The Historic Collections are available for research or visiting by interested parties whether civilian or forces, during normal working hours by arrangement with the Librarian.

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History

The development of the Royal Hospital Haslar: early administration of the hospital

E C Birbeck

This article was recently discovered as one complete sheet of A4 card mounted whilst sorting through old papers and has been edited and historical fact added in order to expand the history regarding events that took place in the first decade at Haslar. A brief background of the inspecting Admirals has also been provided.

The management of Haslar Hospital underwent numerous changes during its 256 years of history. When it first opened its doors in 1753 the responsibility for the day to day running of the hospital lay with the Surgeon and Agent for Gosport. Mr Richard Porter, who had for some time coped with the almost insurmountable problems in the area.

Obviously this gentleman proved unsatisfactory, for a letter from Vice Admiral Boscawen dated 12 April 1755 drew attention to the inadequacies of the administration of the hospital. The hospital at Haslar is so ill conducted that it little answers the design of it. The Admiral laid the blame squarely on the shoulders of Mr Porter.

The Agent is also the Surgeon. His profits by the 6/8d (33p) a per capita payment) are above £2000 per annum and no office of agent alone is sufficient employment for him.

The income of £2000 was incredible for the days and the Admirals comments were endorsed by Mr Ward, who was the contractor for all the stores to be used in the hospital from bedding to biscuits. ... at ... there is drunkenness and all sorts of *indecent business committed by the people there, many of which are very fit from being proper objects for a hospital.*

Was this the staff or the patients one has to ask? No doubt both.

The Commissioners acted quickly and dispatched Sir Edward Hawke to investigate. The accusations were proved correct. Sir Edward on arrival at Haslar finding the gate porter missing from his post and chaos reigning in the hospital. Accordingly the Commissioners issued a series of orders in May 1755 appointing Mr Francis Jones as Agent. Mr Richard Porter, previously both Surgeon and Agent, as the first Surgeon, and Dr George Cuthbert as the first Physician and Senior Administrator. The salary of the latter gentleman was £200 per annum, and although Richard Porter's new salary is not recorded, it must be assumed that he took a substantial cut in income.

Dr Cuthbert administered the hospital with the help of a small council for a few years. His successor James Lind, was perhaps one of the most distinguished of all naval doctors. His work on scurvy and other diseases of seaman earned him the title of Father of Naval Medicine.

Lind in a letter to a friend dated 3rd September 1758, explains the situation thus:

The hospital is under the direction of the Physician in Council – two master surgeons, the agent and steward and lately two new members are added viz. Doctor Welch, Physician to the Forton Hospital (which receives the marines only about a mile distant from us) and the surgeons of that

hospital. But this Council must act entirely by orders from the Board of Sick and Hurt." The Forton Hospital was owned by Nathaniel Jackson was paid on a per capita basis, as had been Mr Richard Porter when Surgeon and Agent for Gosport.

At Haslar, accommodation was to be the main recurring problem for the next hundred years. The hospital was opened early to admit 100 men lying in buildings, huts, and there are constant requests from the Commissioners for more beds to be found such as the urgent instruction of the 31st March 1755: "*You are hereby requested and directed to use all possible expedition in making provision for the reception of 200 additional patients in the hospital at Haslar.*"

Papers held by the National Maritime Museum show that there was much correspondence at the time regarding the provision of beds, linen and cooking utensils, also the employment of staff, who were stated as being unruly and drunk. Other letters demand that greater numbers of patients should be admitted. Even when the two new wings were completed in 1762 the shortage of beds was still acute, and it became necessary to use hulks as hospital ships for temporary accommodation. Although the hospital had been built to hold 1,500 patients, by 1755 1,800 had to be accommodated, and in 1790 Admiral Barrington drew attention in his report to the fact that there were 2,100 patients in the buildings, causing considerable overcrowding.

But these were only some of the problems facing Doctor Cuthbert and his successors. The patients, largely pressed men, were not dedicated to the Fleet in which they served. As soon as they were able to walk they were anxious to disappear into obscurity to avoid the press gangs. They were described as both "*numerous and ungovernable*".

The hospital staff could not be compared with the disciplined and dedicated body of doctors and nurses who manned the hospital in later centuries. The nurses were in general associated with drunkenness, theft and forgery, and a level of sexual activity which makes today's so-called permissive society appear almost puritanical. One Nurse Brown was dismissed by the Hospital Executive for infecting a number of patients with a foul disease, while a letter written by three patients in December 1761 demanded that act on be taken against staff who had threatened them and others, one nurse had even gone so far as to draw her knife, and the patients were afraid to eat their rations lest they be poisoned.

To bring a semblance of order to such a scene was an impossible task, and although early physicians did try valiantly, their efforts were doomed to failure. James Lind drew up a comprehensive and thorough list of rules and regulations for the efficient management of the hospital, but it is doubtful if they were ever used, even as guidelines, let alone as rules to be obeyed.

One of the reasons originally given for the erection of the hospital was to stem the "*pernicious evil*" of desertions, and yet numbers "*discharged run*" were enormous. Records show that some patients even escaped to take shore leave, returning to Haslar in a worse state than when first admitted. Gradually complaints increased, and when the Executive Captains of the Navy began themselves to complain to the Admiralty, something had to be done. The first of two major official investigations into the management of Haslar was initiated by the orders of the Privy Council.

On the 26th August 1795 Captain William Yeo (died 1808, and buried in the Paddock but at ground) took command of Haslar, assisted by two Lieutenants. Such was the order for the next hundred years.

Cast of admirals

Barrington, Samuel (1729–1800). Served with Hawke in the Seven Years War and was responsible for the Relief of Gibraltar in 1782.

Boscawen, Edward (1711–1761). Made Vice Admiral in February 1755 and a Lord of the Admiralty. In July 1755 took on the French in the North Atlantic at the opening of

the Seven Years War [illegible] from 1757 where no d[illegible] r atters at Hastar one [illegible]

Hawke, Edward [illegible] *1705–1781)* Con n a[illegible] [illegible] ee n he defeat of the Franc[illegible] [illegible] tt of [illegible] Qu beron Bay in Novamber 1759 Rated as one of the greatest sea battles

Acknowledgement. Jane Wickenden Historical Collect ons Librarian INM

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Errata

Mello A [illegible] J K [illegible] *on the battlefield what can we do and* [illegible] J R [illegible] 136 141 2009

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Book Review

The Royal Hospital Haslar: a pictorial history

Eric Birbeck, Ann Ryder and Phillip Ward Chichester Phillimore, 2009; ISBN 978 1 86077 589-5, £18 99, xiii, 114 pp

As the Preface states this is a pictorial record rather than a history and accordingly not necessarily complete Rather than containing a single chronological sequence throughout the book consists of a theme within each chapter although beginning with the hospital's building and antecedents and ending with its closure However by giving the reader thematic glimpses rather than a direct sequence of events it does show the variety and changefulness as well as in some cases the unchanging nature – of work and life at Haslar

Themes include hospital interiors the two chapels and QARNNS and VADs (contributed by Captain Julia Massey RRC) among others recent excavations by Cranfield University's Centre for Archaeological and Forensic Analysis team are also featured Many of the illustrations are those to be found in any history of the hospital but some especially of smaller details less readily noticed are both unusual and interesting

Books with more than one author often appear to have been designed by committee but Eric Birbeck Ann Ryder and Phillip Ward have between them avoided this failing Nor can the standard of production be faulted Phillimore have produced a good looking book in which the illustrations both colour and monochrome have reproduced very clearly

While most of the quotations are referenced it is a shame there is not a bibliography or at least a list of further reading

A final note Haslar Stonehouse and Chatham were indeed the first three naval hospitals to be built in England (as referenced on the front flap of the book jacket) they were preceded by the Royal Naval Hospitals at Jamaica and Port Mahon Although inevitably resources for these hospitals are limited it would be good eventually to see something similar undertaken for the history of the Royal Naval Hospitals abroad

Jane Wickenden
Historic Collections Librarian Institute of Naval Medicine Alverstoke

Service News

Honours, Awards and Citations

Honours

Surgeon Commander S A Srapley Royal Navy
Queen's Commendation for Valuable Service

Medals

Lieutenant Commander L Hazard Royal Navy
Commandations for Distinguished Service in Afghanistan on HERRICK 9

Colour Sergeant D Glaze Royal Marines
Commendations for Distinguishen Service in Afghanistan on HERRICK 9

Warrant Officer 1 (Medical Assistant) J Cook
Commendations for Distinguished Service in Afghanistan on HERRICK 9

Chief Petty Officer [illegible]
Long Service and Good Conduct

Petty Officer Medical Assistant [illegible] McLea
Long Service and Good Conduct [illegible]

Awards

Surgeon Captain M Mid[illegible] Royal Navy
Pybus Medal presented by the Royal College of Surgeons of England Surgical Society

Surgeon Lieutenant Commander J L Mackay
Brown Royal Navy
Part 1 MFOM

PROMOTION

Surgeon Commander to Surgeon Captain

Surgeon Commander S W S Millar Royal Navy

Acting Surgeon Commander to Surgeon Commander

Acting Surgeon Commander W A M Dow Royal Navy
Acting Surgeon Commander D A T Gay Royal Navy

Surgeon Lieutenant Commander to Surgeon Commander

Surgeon Lieutenant Commander D E B Ayers Royal Navy
Surgeon Lieutenant Commander M F Henry Royal Navy

Placed on Retired or Emergency Lists

Commander W Durning Royal Navy

Surgeon Lieutenant to Surgeon Lieutenant Commander

Surgeon Lieutenant J McKinlay Royal Navy
Surgeon Lieutenant A Fries Royal Navy
Surgeon Lieutenant S Fry Royal Navy

Acting Lieutenant Commander to Lieutenant Commander

Acting Lieutenant Commander L Hazard Royal Navy

Lieutenant to Lieutenant Commander

Lieutenant J A Abey Royal Navy
Lieutenant D A Pickering Royal Navy
Lieutenant K E Huggins QARNNS
Lieutenant I C Kennedy QARNNS

Return Visit

December 2009 [illegible]
berat on Army Na [illegible]
ave nvaluable in [illegible]

Future Events

Primary Care Symposium (GP and OM)
22–23 April 2010

Combined Services Orthopaedic Society Conference
14 May 2010

James Lind Seminar and Dinner
21 May 2010

SpR Symposium 2010
17 and 18 June 2010

MDG(N) Symposium
23 and 24 June 2010

In order to increase awareness of our [illegible] Journal it has [illegible] agreed that [illegible] will each publish the respective contents pages

Journal of the Royal Army Medical Corps

Volume 155 No 2
June 2009

In order to increase awareness of our sister Journal it has been agreed that we will also publish the respective contents pages

Journal of the Royal Army Medical Corps

Volume 155 No 3
September 2009

[illegible] and Head and Neck Surgery *R Corbridge A Thirlwall*
[illegible] or *P Martinez Devesa*
[illegible] Primary Care Medicine 2008 Edition *P D Chan*
[illegible] *Stanford*
[illegible] non Chalice – The Emperor and his Doctors on St Helena
[illegible]

Campaign Medals S[illegible] 1879

Footnotes & Endpieces D[illegible] Kennedy and the sexual transmission of Brucellosis
H[illegible]

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Obituary

Surgeon Vice Admiral Sir James Watt KBE, Medical Director-General of the Royal Navy

August 19, 1914 - December 28, 2009

James Watt's appointment as Surgeon Vice Admiral and Medical Director General of the Navy in 1972 was the culminating point of a remarkable naval career that was matched and even surpassed by the astonishing range of his achievements outside of uniform.

After qualifying in 1938 from Durham University he was house surgeon at Ashington Hospital, then resident MO at the Princess Mary Maternity Hospital in Newcastle. Having joined the Royal Naval Volunteer Reserve, he was appointed in January 1941 as Surgeon Lieutenant Commander to the light cruiser Emerald which protected trade in the Indian Ocean and Persian Gulf until the fall of Singapore, being lucky to survive the near massacre by the Japanese of Royal Navy cruisers in that theatre. A particular challenge occurred when Emerald was badly damaged in a collision with 14 killed and several injured.

Returning home, he was posted to the Roxborough, one of the 50 obsolete and notoriously unhandy four-pipper destroyers loaned to Britain by the US under Lend-Lease during the nadir of the Battle of the Atlantic. In a violent storm while escorting a convoy to Halifax, Nova Scotia, Roxborough suffered catastrophic damage to her bridge structure killing both the captain and second in command as well as nine others and with several also injured. Incapacitated, she made it to St Johns, Newfoundland, using emergency steering and under the command of a Canadian sub lieutenant, the senior surviving seaman officer.

Remaining on that side of the Atlantic, Watt had a short tour in support of the naval aircrew training establishment HMS Asbury in New Jersey before joining in 1944 the American built escort carrier Arbiter where he remained until 1947. Arbiter was mainly employed ferrying aircraft to the British Pacific Fleet and returned home with repatriated prisoners of war, many in a poor condition. Watt was mentioned in dispatches for his work.

After two years at Newcastle he returned to naval duties again in the Far East, in the hospital ship Maine during the Korean War and later as the surgical specialist for the naval hospital in Hong Kong until 1955 when he became a Fellow of the Royal College of Surgeons. Subsequently he served as surgical consultant in naval hospitals at Plymouth, Malta and Haslar in Gosport, then Professor of Naval Surgery to the Royal College of Surgeons.

Promoted to rear admiral, Watt became from 1969 the first Dean of Naval Medicine and founding leader of the internationally recognised Institute of Naval Medicine (formerly the RN Medical School) at Alverstoke, Gosport, which researches issues particularly affecting naval personnel — including crew, nuclear submariners and divers — with their associated environmental hazards of pressure, trauma, radiation, noise, vibration, burns and much else. As surgeon vice-admiral, he was the Navy's Medical Director General from 1972 to 1977, being appointed KBE in 1975.

During his career he published widely on subjects as diverse as burns, cancer chemotherapy, peptic ulcers and hyperbaric oxygen therapy. He was a member of the British Society for Surgery of the Hand, the International Society for Burns Injuries and a corresponding member of the Surgical

Research [illegible] board [illegible] 1966 [illegible]

[illegible] of medicine [illegible] fired in a honorary [illegible] Ramsay (1733 89) — A Naval Pioneer. [illegible] More than 100 publications on burns surgery and especially nautical medicine. He made contributions to four books including Starving Sailors (1981) and Talking Health (1985) while his chapters in Mens Incognita A Discourse on Discovery won the Canadian Prize for Maritime History in 2000. Particularly noted was his lecture in his 90th year after much research in Paris to the Worshipful Company of Barbers in 2005 on Surgery at the Battle of Trafalgar British and French Experiences subsequently published in the Mariners Mirror. He had been a Freeman of the company since 1978.

Watt's administrative skills were much in demand. He served on the Environmental Pollution Research Committee and was an honorary vice president of Epsom College. From 1983 he was vice president of the Society for Nautical Research and from 1996 president of the Smeatonian Society of History at the University of Calgary where he was also a visiting professor. Elsewhere he was a visiting Fellow at the Australian National University in Canberra and foundation lecturer to the Royal Australian College of Surgeons. A Fellow of the Royal Society of Medicine he was its 91st president from 1982 to 1984 and was made an honorary Fellow in 1996.

Watt was a committed Christian throughout his long and active life supporting his local churches as well as the Council of Reference of the Christian Medical Fellowship. He was a founder member of the Naval Christian Fellowship which has spread to navies across the world. He was president of the Naval Lay Readers Society from 1974 to 1983 and of the Institute of Religion and Medicine. For 20 years from 1983 he was also president of ECHO International Health Services which provides financial support for medical institutions mainly in sub Saharan Africa.

He was vice president of the Churches Council of Healing from 1987 and a trustee of the Marylebone Centre Trust. His writings in this field included What's Wrong with Christian Healing and The Church Medicine and the New Age.

His many friends crossed international boundaries. He was a lifelong bachelor and his main interests were music and hill walking.

He died on December 28 2009 aged 95.

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Obituary

Surgeon Commander Brian Maurice Adams BAO MB MCh DMRD

Surgeon Commander Brian Adams died suddenly on 12 November 2009, six days short of his 70th birthday.

He was born in Belfast into a Royal Naval medical family and educated at Campbell College and Queen's University Belfast where he studied medicine. After qualifying and completing his pre-registration year, he joined the Royal Navy in 1963. Two years later whilst serving in Royal Naval Hospital Haslar he suffered a severe stroke but managed to make a full recovery. He went on to specialise in radiology and it was while he was undergoing his specialist training in London that he met and married a young Scottish physiotherapist, Fiona.

Brian had spells of duty at Haslar as well as overseas in Malta and Singapore but his home base was always at Royal Naval Hospital Plymouth where he served for eight years as Head of Radiology and three years as Mess President.

He retired from the Royal Navy in 1992 but then served for four years as a Medical Officer in the Royal Fleet Auxiliary Service before retiring in July 1996.

In his younger days Brian was a keen lacrosse player and a first class golfer. He had a low single handicap and represented the Royal Navy in the Inter Services competition for several years.

He was a keen caravanner and walker and he loved gardening, devoting many hours of his retirement to his beautiful garden in Russell Avenue in Plymouth. Above all, Brian was a great family man. Not only did he take great pride in his daughter Lindsay, son Richard and son-in-law Danny, but also his nephew and nieces and their children who knew him as GUB (Great Uncle Brian).

We extend our sympathy to Fiona, Lindsay, Richard and Danny and to all his family.

A M Harrell

Notice has been received of the death of the following:

Surgeon Vice Admiral Sir John (JAB) Hallison

Surgeon Captain John Henry Murray Young

Captain Claire Taylor QARNNS

Wing Commander Keith Rossill Royal Air Force

It is intended to publish obituaries in the next issue. Any words in memory of them are gratefully received.

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Manuscripts must be in English in a form suitable for publication as against oral presentation Uniform Requirements For Manuscript Submitted to Biomedical Journals (N Engl J Med 1997 336(4) 309-15) gives guidance Scientific papers should be prefaced with an abstract of the hypothesis argument and findings This should not exceed 150 words Headings within the text should be used to highlight the content of different sections Where possible manuscripts should be prepared in Microsoft Word on CD or floppy disc

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The title page should contain a concise informative title, up to five key words, the names and initials of all authors and their appointments and the department(s)/institution(s)/ship(s)/establishment(s) where the work was carried out.

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Tables and illustrations (figures) should add to the paper rather than only repeating information presented in the text. Each table and illustration should be on an individual page separate from the text, be numbered in two distinct sequences in the order in which they are mentioned in the text and have an explanatory caption (typed on a separate sheet for illustrations).

News photographs of academic, social, sport or other occasions involving members of the Royal Naval Medical Service are welcomed.

Normally printed illustrations will be monochrome. The views of the Editor should be sought where colour illustrations thought to be essential or highly desirable. Photographs must be of good quality, glossy, unmounted and be provided in camera ready form with redundant areas trimmed off. The figure number, author's name and top/bottom should be marked on the back. Line drawings should be professionally drawn and labelled, or of equivalent standard and submitted as photographic prints or high quality photocopies. Lettering and numbering should be sufficiently large to ensure legibility after reduction for publication. Freehand lettering is not acceptable.

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Measurements should be given in the units in which they were made but, with the exception of blood pressure in mmHg and haemoglobin concentration in g/dl, non metric units must be accompanied by metric (SI) equivalents. The approved name of drugs should be used (proprietary names may follow in parentheses). If an abbreviation is used, the term for which it stands should be given in full at its first mention in the text, e.g. Institute of Naval Medicine (INM).

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Acknowledgements

The assistance of those who are not authors but made substantial contributions to the study and/or preparation of the paper should be acknowledged as should the source(s) of grant support, equipment, drugs, facilities etc.

JOURNAL
of the
ROYAL NAVAL MEDICAL SERVICE

Vol 96 2 2010

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ISSN 0035 9033

Contents

Editorial

The past few months have been a time of considerable activity for the Royal Naval Medical Service. We have seen a series of high profile events [illegible] with a very successful dinner on HMS VICTORY, special items at [illegible] wide MOG(N) symposium. The calibre of the speakers and [illegible] to these events including the President of the Royal College of Surgeons [illegible] the Chair of Council of the RCGP is testament to the high [illegible] at the Institute of Naval Medicine we held a second history [illegible] me to commemorate the anniversary of James Lind's birth [illegible] the symposium (accompanied by a circus themed dinner) will [illegible] becoming a regular feature. On a sadder note Fort Blockhouse is gradually [illegible] down as lodger units wind up or transfer out and the surviving Blood Red Cross party will probably be the last such event on this historic site.

Operationally we are supporting 40 Commando deployed on Herrick 12 and start [illegible] wind up to the major Herrick 14 deployment next spring where once again the RN will have primacy. In parallel there is the ongoing constant drip feed of individual augmentees to Afghanistan. We remain prepared for our principal maritime operational role and in support of this RFA ARUS recently deployed in her PCRF role. In a fortnight she was able to achieve a work up of the new facility an exercise and a formal assurance visit.

In the midst of this activity there has been the establishment of Surgeon General's new headquarters in Collman House at Whittington Barracks near Lichfield and the latest strategic Defence and Security Review (SDSR) which will result in huge changes across Defence.

It is neither possible nor appropriate for this Journal to keep track of all that is going on and deal with our increased number of contributions we cannot get any larger without putting up subscription (or circulation) rates. However I hope that through reading the articles submitted you will gain a flavour of the variety of work Royal Naval Medical Staff are engaged in as well as the pace of change. To this effect this journal continues the inclusion of a number of clinical articles with narrative of experiences of medical staff and a continued theme of the history of our branch.

I am particularly keen to develop the latter so that in years to come the journal will be a rich source of information about the present and immediate past era any such reminiscences welcomed.

David Brown

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Clinical

Is damage control surgery appropriate in vascular trauma in the field?

S W F Middleton, D M Nott, M J Midwinter, A W Lambert

Introduction

Vascular injuries have been a major cause of battlefield mortality over the course of history and uncontrolled haemorrhage remains a leading cause of preventable death (1). Modern warfare, updated equipment and changing enemy tactics has produced certain injury patterns while modern body armour protects the torso it does allows penetrating injury to occur at the junctional zones (neck, axilla and groin) and the limbs. Employment of Damage Control Resuscitation (6), the use of novel haemostatics and the battlefield tourniquet have led to improved casualty survival with an observed increase in vascular workload (2). This modernisation of the battlefield has led to a measurable survival advantage (3) and can potentially lead to an improved physiological condition of the patient arriving in medical facilities allowing more surgical options to be considered.

With an increase in survival from vascular injuries, surgeons need to have the confidence and competence to make complex decisions about the management of these patients. Currently military surgeons deploy to operational theatres in the role of military trauma surgeon. They are drawn from a pool of surgeons covering all sub-specialties but are required to [illegible] if the same role, irrespective of their own sub-specialty interest. Previous military surgical training was very broad with exposure to all the major subspecialties. The pattern of training has changed since the introduction of MMC and EWTD so surgeons may not have such a broad experience as they did previously.

The term 'damage control' originally stems from naval terminology and relates to the containment of fires or floods onboard ship. Stopping the spread by cooling boundaries or shutting water tight hatches and doors allows the ship to continue fighting and operating. The hastily patched up damage can then be formally repaired in a planned and methodical fashion at an appropriate time after the initial engagement. The concept of damage control surgery introduced by Rotondo (4) evolved from this action of plugging holes, stabilising and stopping the spread of 'danger'. Then formally repairing the damage at a time when physiological normality has been restored or approached. The use of a time limited procedure to control haemorrhage, halt the spread of infection and contamination and prevent further injury is followed by a period intensive care with normalisation of physiology. This period, typically 12 to 24hrs, aims to normalise physiological parameters with emphasis on coagulopathy, thermoregulation, acid base balance and hypotension. When stable, definitive surgery can be considered.

In the context of a military patient, there are escalating levels of care that exist further back from the front lines of fighting, ultimately ending up with repatriation to an appropriate hospital facility (Table 1). This figure demonstrates the stratification of care that exists on the battlefield. It starts with the soldier, the equipment they carry (personal morphine mini-jet, first field dressing and tourniquet) and care that combat medics can provide. Combat medics will have passed the BATLS (Battlefield Advanced Trauma Life Support) which trains individuals in the immediate life saving skills that they will hav

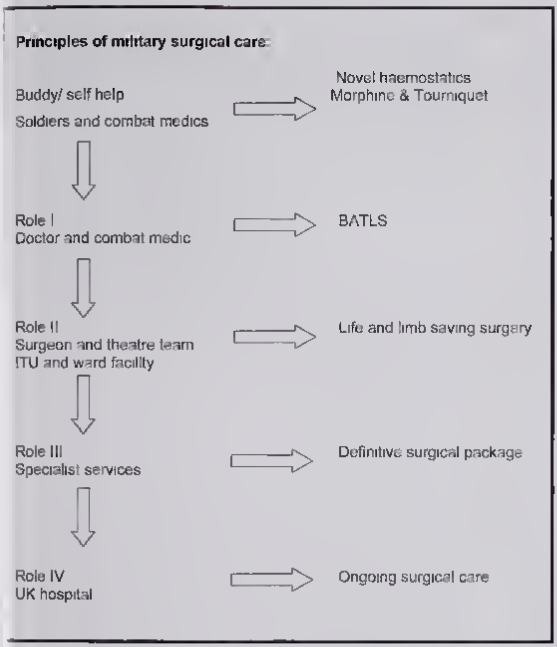


Table 1. Principles of military surgical care

o use with the resources that have on them in their medical packs. The levels of care further along the chain are steps up in capability and resources with surgery possible from Role II onwards. The movement of patients does not necessarily occur in a stepwise progressive manner but patients will move along the chain according to need and transport availability.

The initial phase of the damage control surgery is likely to take place in a Role II medical facility. Damage control resuscitation (DCR) can also be commenced at this echelon. The Role II facility is a hospital unit with capacity for 25 beds and facilities to operate

on a [illegible] orthopaedic [illegible] phase [illegible] be [illegible] transfer [illegible]

D[illegible] vascular [illegible] operative [illegible] planned [illegible] surgery can be [illegible] The temporising measures of [illegible] shunting and ligation with fasciotomy employed to reduce haemorrhage, limb loss and salvage of limbs is not always practicable in the military setting. As a consequence of a high military tempo or resource limitations it may not be possible to move the patient down the casualty chain after DCS. The aim of DCS is to halt the downward spiral of coagulopathy, acid base disturbance and hypothermia and facilitate onward transfer to a unit that is better equipped to repair the defect. This has to be used in conjunction with damage control resuscitation as the two should not be viewed as separate.

This paper aims to look at a discrete period of time and use case histories to illustrate and discuss the surgical decision making behind vascular injury surgery in the context of war.

Methods

Prospective data was recorded for casualties attending the UK Military Medical Treatment Facility, Basra, Iraq (Role 2 enhanced) during a two month period of the summer of 2007. All cases of vascular injury were identified and their case histories reviewed.

Results

Twenty major casualties (P1 or P2 (Table 2)) arrived at the facility during the study period, all had been wearing issue protective head and body armour at the time of their injury. The injury modalities included HVGSW (high velocity gunshot wound), fragmentation from IEDs (improvised explosive devices) or RPGs (rocket propelled grenade) and mortars fire. Six patients had significant arterial damage that was operated on including carotid artery, axillary artery, brachial artery and crural vessels. Three were primary arterial reconstructions with good outcomes (crural bypass, axillary artery bypass and brachial artery vein patch), one patient underwent carotid exploration, another underwent primary amputation and there was one death. Neither shunting or packing was employed in any of these cases.

- Priority one (P1) Those needing immediate life saving resuscitation and/or surgery
- Priority two (P2) Those needing early resuscitation and/or surgery but where some delay is acceptable
- Priority three (P3) Those who require treatment but where a longer delay is acceptable

Table 2. BATLS Manual list

Case Histories

Presented below are four cases that highlight aspects of damage control surgery within the context of vascular injuries and surgery.

Case 1

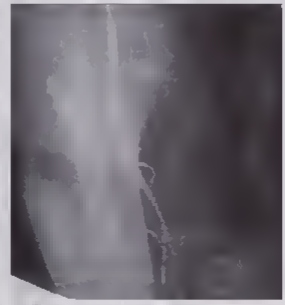
A soldier received a fragmentation injury to his neck and face and presented with a rapidly expanding haematoma on the right hand side (figure 1). The wound was explored and a fragment removed from adjacent to the carotid artery in zone 2. The carotid artery was intact and the bleeding site identified as small vessels and dealt with. The wounds were excised and primarily closed with the patient making a full recovery.

The concern was an injury to one of the main vessels of the neck and exploration with a view to definitive repair was the only option given the expansion and risk of airway obstruction. This could only have been undertaken if the surgeon was confident with exploration of the neck and to deal with the finding. In this instance with the vessel undamaged there was no need to proceed to repair.

g 1 Expanding haematoma on the right side of e neck

ig 2 Exploration of the neck haematoma and [illegible]

[illegible]



1 Vascular injury of the [illegible]

.ase 2

soldier received a HVGSW to upper arm. A ourniquet was applied in the field by a colleagu nedic. Under general anaesthesia proximal ontrol of the axillary artery was achieved at [illegible] evel of the infraclavicular axillary artery by voiding pectoralis minor prior to removal of [illegible] ressing and wound exploration. Disruption [illegible] he axillary artery distal to the control point [illegible] dentified and a reverse vein interposition graft [illegible] figure 2) was used to repair the damage with [illegible] he vein being harvested from the long saphenous vein in the thigh. Fasciotomies of the forearm were performed. The limb was successfully reperfused with no functional abnormality. The case described above highlights the need to be able to gain proximal control. Surgeons need to be able to gain access to the arterial supply of limbs proximal to the injury to control haemorrhage. This includes iliac or femoral and subclavian and axillary arteries.

.ase 3

This patient received a through and through shot HVGSW to the calf and presented with acute lower limb ischaemia (figure 3). After control

the femoral artery a[illegible] femoral artery on on table angiogram [illegible] performed (Figure 4). At operation the anterior tibial artery was found to be avulsed off the back of the distal popliteal artery. At that site there was a hole in the artery which was not apparent from the arteriogram. The proximal control was

Figure [illegible] Limb wound on [illegible] with bar[illegible]

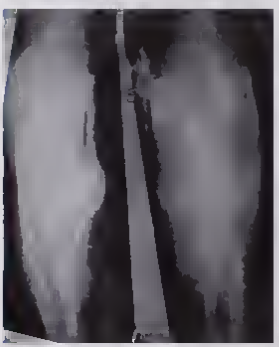


Figure [illegible]

then moved distally to include the origin of the anterior tibial artery and the proximal hole in the popliteal artery. The hole in the popliteal artery had to be repaired and it was felt that it was easier to repair it using a graft harvested from the long saphenous vein in the thigh than to use a patch. The other end could be anastomosed to the proximal anterior tibial artery in the lateral aspect of the calf. On inspection the lateral compartment of the calf was looking ischaemic and the decision to try to revascularise it was made using the vein graft. The bullet track was thoroughly debrided and the resulting tunnel used for the graft. Four compartment fasciotomies were performed and the limb was salvaged with no functional loss.

This case demonstrates the need for early proximal control of haemorrhage which in addition allows radiological imaging. The primary repair was successful prior to patient repatriation.

Case 4

The final case is that of a blast injury to the upper arm when a combat medic applied a tourniquet to the upper arm. Examination of the limb revealed extensive bony and soft tissue loss with significant neurological and vascular damage (figures 5 and 6). Radical debridement of the wound resulted in amputation above the elbow (Figure 7). This case demonstrates that there may be a need to do a primary amputation in cases and this

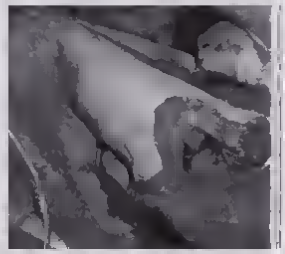


Figure [illegible]

does constitute damage control surgery. The patient would have progressed down the spiral of coagulopathy, hypothermia and acidosis had the limb been given the benefit of the doubt and transferred for an attempt at revascularisation making a limb threatening injury into a life threatening

Discussion

The cases above highlight the decision making process when faced with vascular trauma in the field. The cases look specifically at the surgical decisions made in the context of the available resources and care at the Role II enhanced facility. DCS should be used in conjunction with DCR and has been with implemented with measured success (6). Thanks to the rapid normalisation of patients, DCR has meant that where before life protective amputation was rightly undertaken now limb salvage procedures are possible within the window of opportunity. Charles Fox et al (6) presented a series of data taken from a similar period of combat demonstrating excellent results in limb salvage from the use of aggressive damage control resuscitation linking DCR with DCS to staying out of trouble, rather than getting out of trouble.

DCR has added a dimension to vascular trauma surgery in the military setting challenging the mantra of DCS as a standalone entity. DCR has undoubtedly enhanced the prospects for patients with severely injured limbs of having a successful vascular repair that might previously have not been attempted. DCS on its own does still have a role in military trauma and has to be employed in situations where the military tempo dictates it. The options in that case are few and the surgeon has to have the necessary skills and confidence to make these decisions and act in the best interest of their patient.

Amputation of mangled extremities still remains an option for DCS. The high energy transfer that causes massive tissue disruption associated with military vascular injuries is also likely to have causes an underlying fracture which has been demonstrated to have a worse prognosis in terms of complications of the vascular repair(7). The decision to amputate remains a highly challenging one for the surgeon and there are currently [illegible] scoring systems that aid the decision process. MESS (the mangled extremity scoring system) has been shown to be a less reliable tool in predicting primary amputation in the military population than in the civilian population which it was designed for use. In the same report (8) the authors did identify two of the four criteria that make up the MESS as having the strongest positive predication value with the outcome measure as amputation. These two were limb ischaemia and being persistently hypotensive. The two other criteria of low positive predictive value in the MESS are age and degree of skeletal and soft tissue injury. The consideration for amputation has changed along with the introduction of DCR, which now opens the door for more complicated primary vascular repair in an attempt at limb salvage providing that the resources are available to support such attempts. In a situation where limited resources are available then primary amputation still remains an option in life saving damage control surgery.

It is likely that the best possible outcome was achieved for cases two and three presented in this paper by proceeding to definitive care rather than a damage limitation procedure. Had they undergone a longer period of ischaemia then the outcome might have been different. It is imperative that the surgeon has situational awareness and knows what is happening or about to happen in the area of operations in order to maintain surgical capability to the command. The decision to do a primary repair was made because the surgeon had the technical ability, the battle situation allowed the time necessary and the concurrent operative workload meant that resources were not stretched. Had this not been the situation then the decision making might have been different and the outcome less favourable.

Conclusion

DCS is an important component in military trauma surgery. With the advent of DCR its role in the management of patients with vascular injury needs reassessment.

The deployed military trauma surgeon has

more factors to evaluate when making decisions then they would do in the more controlled civilian environment. The ethos remains do the best possible for the patient but ever increasing sub specialisation as a surgeon means that general surgeons have less exposure to vascular injuries in their daily practice. This skill gap has to be addressed and military surgical trainees must have appropriate training in a wide range of surgical skills. These skills should be tested regularly in order to remain competent in the field of vascular surgery and be confident that they are making well balanced decisions about when to and how to best serve their patients. As important as teaching in technical skills is appropriate training in decision making in this specific environment that military surgeons practice. At the time writing an MSc in Military Trauma Surgery and the Military Operational Surgical Training (MOST) course have been developed address the skill gap. It is imperative that military surgical training involves exposure to the major surgical specialities.

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Clinical

Fixation and Deformity Correction by Plate Osteosynthesis of a Tibial Shaft Malunion after Traditional African Bone Setting

I Findlay, C McLean, M Kotrba

Abstract

Given the global nature of modern travel and the possibility of deployment to the African continent, it is conceivable that medical officers in the course of their general duties may be exposed to patients managed with traditional bone setting techniques. Whilst these techniques may prove effective for many, complications may still arise and their management may be challenging.

Introduction

Traditional bone setting (TBS) techniques are still popular in certain areas of Africa. Access to health care and distrust of modern techniques leads to the use of herbal splints with spiritual incantations in attempt to achieve fracture fixation. The potential complications of this approach may be severe. Although a major problem in the developing world, such cases may rarely present to British or other Western healthcare systems. However, with increasing global travel orthopaedic surgeons previously unexposed to such treatment may be required to treat its consequences.

Case Report

We report a case of a 17 year old boy, who presented to us 3 months after sustaining a multifragmentary fracture of his midshaft tibia and fibula (AO-42A3). The injury occurred playing football and was treated in his native Ghana with traditional bone setting techniques. He presented with an obvious malunion and a varus deformity of his lower limb (Figure 1).

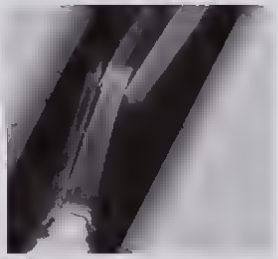

Figure 1 AP

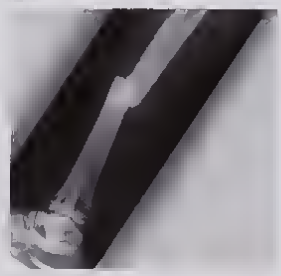

Figure 1 L

He was neurovascuely intact and had evidence of chronic skin changes over anterior tibia. His mother was a nurse on elective ward and after consultation with family re-fixation of the fracture was deferred upon due to his poor initial outcome.

A posterolateral approach to the tibia and fibula was used for fracture exposure. Osteoclasis was carried out and the fracture reduced. A 4.5 mm locking plate was used to stabilise the tibia and a small fragment plate for the fibula. Demineralised bone matrix putty was used along with autologous bone graft.

He was kept non weight bearing for 6 weeks and progressed well with clinical evidence of fracture healing at 6 weeks and callus formation at 3 months (Figure 2). At follow up (9 months post op) he was made a full recovery.

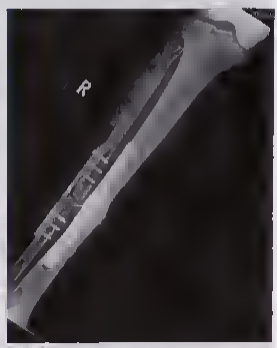

Figure 2. Lat

[illegible] al [illegible] les [illegible] ed[4 & 5]. Resection [illegible] s tissue is paramount foll[illegible] n and stable fracture fixation.

Discussion

Documented in Egyptian times, bone setting for fracture fixation is now unheard of in Western culture. However due to traditional beliefs, fear of modern medicine and lack of access to health care, it still widely practised, especially in Western Africa. Tight splinting of the affected limb often with herbal dressings is the mainstay of treatment. The cost and incidence of these serious complications are well documented[1 & 2]. The most serious of which is gangrene and a trans-amputation may never reach Western care. With increasing global travel and access to health services as well as education of patients and relatives exposed to bone setters, British orthopaedic surgeons may well be more exposed to the chronic complications of conform or treatment.

Even without initial bone setting, management of tibial shaft fractures are well documented for non pilation. Jones and Bennett described gentle bone-grafting for non union through the posterolateral approach in 1965[3]. It allows excellent exposure of the fracture sites in order to perform osteotomy, end reduction of the fragments. The one nervous plane between gastrocnemius and soleus and flexor hallucis longus muscles

Conclusion

With the increasing globalisation of health care British orthopaedic surgeons should be aware of and prepared to treat the complications of traditional bone setting

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J Royal Naval Medical Service 2010 96 2 88 91

Clinical

Asthma and exercise; a testing issue?

N Martin, D P Whitehouse

There is an increasing prevalence of allergy and asthma in children in the European population. With most recent estimates in young people showing an atopy prevalence of 20% and an asthma prevalence of 8% [1]. This increasing asthma prevalence has resulted in an increasing number of asthmatics entering the workforce, producing new challenges to industries which have traditionally excluded asthmatics from employment [2]. It is not surprising then that asthma continues to be a significant issue for the military in terms of recruitment and employability [3,4]. With an increasing tempo of operations in austere and remote environments as well as the risks of barotrauma in physiologically extreme environments, the military require a thorough detailed and reliable testing system.

Asthma remains a clinical diagnosis based on all definitions is the presence of symptoms (more than one of wheeze, breathlessness, chest tightness or cough) and of variable airflow obstruction demonstrated by either fluctuant peak expiratory flow rates or variation in forced expiratory volume in one second (FEV1). More recent descriptions of asthma in children and in adults have included airway hyperresponsiveness and airway inflammation as components of the disease but how these features relate to each other, how they are best measured and how they contribute to the clinical manifestations of asthma remains unclear [5].

Exercise related symptoms occur in up to 50% of asthmatic patients and are often the most incapacitating aspect of the disease in young people and the least responsive to conventional therapies [6]. However evaluation of exercise-induced asthma is not straightforward as exercise related respiratory symptoms are common in all adolescents [7]. To complicate matters further, elite athletes, particularly those habitually exercising in physically challenging environments, commonly report exercise related respiratory symptoms and have a high incidence of airway hyperresponsiveness [8]. Thus, with in the population of young adults with exercise-related respiratory symptoms there may be multiple phenotypes of disease differing in their pathophysiology and treatment response.

Against this background there are controversies in how to effectively diagnose and manage patients with exercise related symptoms. Straightforward pulmonary function testing in fit young people is not sufficient and exercise testing itself is expensive, time consuming and impractical in most settings. This has led to the substitution of specialised airway challenge tests in the diagnosis of exercise-induced bronchoconstriction, working either directly on the airway or indirectly via inflammatory mediators. Varying responses to these challenge tests by individuals with the same symptoms have made the diagnostic challenge even more complex [9].

There are few studies in the published literature that have tried to address this issue in military populations. It has been acknowledged as an issue for some time [10] but most historical studies have been retrospective or cross sectional [11]. In the only large prospective study, 799 recruits who had normal spirometry and normal exercise challenge results on entry to service were followed up for a 30 month period [12]. Of concern is the high number (16%) of this cohort that had a documented deterioration in

respiratory health during the 30 month follow up period with those attached to frontline combat units most affected. The authors do not explore how best to predict who this group may be and how best to screen them out at the point of selection, but they have served to highlight the magnitude of the problem.

With the paucity of real life information we need to extrapolate from other highly studied groups of active, fit young people. Performance level athletes have come under closer scrutiny in recent years because of increasing use of asthma medication at elite level (12, 13). This has led to the introduction of extensive testing and screening in these individuals with a wealth of generated research. Whilst there are concerns that the highly motivated athlete population, who probably under report their disease and which does not include those who quit (the healthy worker effect), may not be representative of a conscription defence force, they make a reasonable control population for a motivated professional, voluntary armed service such as that of the UK.

In the general asthma population the consensus remains that the presence of exercise related symptoms reflects poor underlying control of airways inflammation (5). Traditionally this has been called exercise induced asthma (EIA). Usually other symptoms associated with asthma are present, there is objective evidence of eosinophilic inflammation and long-term use of inhaled corticosteroids results in improvement of all these features (14). Within the athlete population there is increasing evidence that symptoms are not good predictors of disease, symptom responses on questionnaires provide a limited perspective and there is poor agreement between symptoms and objective measures of airway dysfunction (15). Exercise induced bronchoconstriction (EIB) is often experienced in the absence of other symptoms, suggesting that the mechanisms and underlying pathophysiology may be different. Several lines of evidence support this view. Firstly, the airway inflammation in athletes has been shown to be less steroid [illegible] than [illegible] asthma (17,18). Secondly, within the population of athletes with exercise-induced bronchoconstriction there are marked differences in atopy between summer and winter athletes and between different sports (19) whereas EIA is closely associated with atopy. Finally, there may be a causal relationship between training intensity and environment (20) and increasing airway inflammation, airway remodelling and airway responsiveness in athletes whereas all the evidence suggest that increasing exercise and physical fitness has beneficial effects in subjects with EIA.

These controversies in diagnosis and disease pathophysiology led the International Olympic Committee Medical Committee (IOC MC) to introduce the need for challenge testing before athletes could use asthma medications in elite level competition and this has provided some information on the usefulness of the various testing modalities. These different challenge tests have different measurement characteristics which we need to consider when interpreting the results, in particular it is useful to draw a distinction between tests such as inhaled methacholine and histamine, which act directly on airway smooth muscle and assess airways hyperreactivity only, and indirect challenge tests such as exercise, eucapnic voluntary hyperpnoea and mannitol, which involve an intermediary pathway such as mast cells or neuronal pathways and thus may provide a more complete assessment of the asthmatic process.

Methacholine bronchoprovocation test

The methacholine bronchoprovocation test is usually carried out in a hospital clinical setting. Increasing doubling concentrations of drug are delivered either by the tidal breathing or dosimeter method and the concentration or dose that creates a 20% fall in FEV1 from baseline is expressed as the PC or PD20. The methacholine challenge test has been well validated as a direct challenge to the airways smooth muscle (21). Clinically it is the challenge test of choice in those patients with

an [illegible] normal [illegible] tests available [illegible] validity [illegible] 30% which [illegible] only [illegible] 22. This [illegible] test in [illegible] false positive [illegible] 24). [illegible] remains a very [illegible] cal test because its high negative predictive value.

Exercise and sports specific exercise testing
Laboratory exercise testing has been well established as an indirect challenge test and has the benefits (and drawbacks) of assessing the individual during the activity in which they complain of symptoms. There needs to be environmental control of both air temperature and relative humidity to standardise results and monitoring of continuous heart rate to determine an appropriate challenge. The test should challenge the athlete to greater than 85% maximum heart rate for a period no longer than 6-8 minutes as longer testing may induce mild bronchoconstriction. A warm up should be avoided to prevent the induction of refractoriness. Traditionally these use either a treadmill or cycle ergometer and assess whole body exercise. However in individuals standard exercise challenge has a low sensitivity for detecting airways dysfunction (24) and in unfit individuals they are often limited by cardiovascular fitness rather than respiratory symptoms. In addition the laboratory environment is not as austere as the environment in which they may be forced to perform (25).

The enhancement of exercise testing with the addition of cold dry air has been felt to improve the sensitivity of this testing modality. In a study carried out on military recruits the numbers testing positive were roughly similar whether the ambient room air or cold dry air was used to supplement the challenge test. Subjects had a more pronounced bronchoconstriction to cold air suggesting that the addition of cold dry air enhances the testing procedure. However on closer analysis only 12 subjects tested positive to both tests suggesting that the addition of cold dry air has defined a different population (12, 26). It is because of these concerns that alternative testing modalities have been developed.

Eucapnic Voluntary Hyperventilation (EVH)
The EVH test was developed to imitate the effects of ventilation at high flow rates on the airway surface liquid creating a drying and osmotic effect (27). It relies on the individual being able to attain and maintain a ventilatory flow equivalent to 85% of maximum voluntary ventilation (approximately 30 x FEV1) for 6-8 minutes breathing a gas mixture containing 5% carbon dioxide to maintain eucapnia. It is a laboratory based test that creates an all or nothing response making it useful in those with normal or supranormal spirometry but questionable in those with abnormal resting spirometry. The diagnostic criteria used by the IOC MC is a 10% drop in FEV1 post challenge) make it a very sensitive test for the diagnosis of airways dysfunction in athletes (28). This has led to the adoption of the EVH test as the gold standard test by the IOC MC and it has been used as a screening test at elite level in some countries (29). One concern is that the criteria for a positive test have been set too low, meaning that relatively few subjects identified have genuine steroid responsive airway pathology (30).

Mannitol
Mannitol is a dry powder inhalation test that acts by developing an osmotic gradient across the airway epithelium, thereby triggering bronchoconstriction by a mechanism similar to that responsible for EIB (9). In a recent large multi-centre study it was found to be as sensitive and specific as a methacholine inhalation test for the diagnosis of EIB determined on laboratory exercise testing (31). It comes as a standardised test kit which contains pre-filled mannitol capsules in escalating doses and a hand-held dry powder inhaler device. It can be used safely in most clinical settings and may be useful in the pre-hospital environment. It has been widely used in the diagnosis of EIB and has helped to determine some of the underlying

mechanisms involved most notably the involvement of mast cells (32 33)

More information is required before we can conclude that these tests are a suitable surrogate for investigating the heterogeneity of exercise-induced airway symptoms In particular we know nothing about whether these tests identify patients who clinically important airway pathology who are going to respond well to corticosteroid treatment or variable responses to the different tests relates issues as each defines a different albeit overlapping population and so the choice of test is important and must be predetermined

Over recent years there have been significant improvements in the phenotyping of asthma in the clinical population This approach has aimed to determine the differing levels of airways dysfunction and airways inflammation that are present in an individual presenting with airways disease and to tailor appropriate therapies to treat this effectively Central to this approach has been the use of inflammometry the assessment of airways inflammation to phenotype disease into eosinophilic or non-eosinophilic disease This is important because we know that the presence of eosinophilic airway inflammation is more closely predictive of a response to corticosteroid therapy than any other marker of disease (34 35) and that there is only a weak correlation between the presence of eosinophilic airway inflammation and either the pattern or severity of airway dysfunction (36) We also know that exhaled nitric oxide is a useful predictor of underlying eosinophilic airways disease (37) and this gives us a very practical non invasive means to assess airway inflammation The potential to use these techniques for the phenotyping of asthma in fit active young people has not been investigated to any degree The usefulness of these tools in screening an asthmatic population has recently been demonstrated (38)

Within the military there are several scenarios where an objective diagnosis of asthma is helpful At the initial selection phase of training we require a robust means of determining the likelihood that any given [illegible] underlying airways disease how [illegible] affect them in training and whether [illegible] likely to develop airways disease [illegible] service life At present this is done [illegible] symptoms based screening system [illegible] may not be ideal and consideration [illegible] given to using a testing system that [illegible] the disease phenotypes There also [illegible] no agreement on testing standard [illegible] way which challenge test is used At [illegible] primary care based assessment [illegible] means to determine airways [illegible] and inflammation would be ideal [illegible] combination of marker as a challenge [illegible] and nitric oxide as a marker of [illegible] airway inflammation world seem promising and such use in some defence forces around the world (39 40)

Another scenario where testing becomes an issue is at the selection level for specialised training in areas where subjects are exposed to pressurised environments such as divers submariners and fixed wing pilots In these individuals there is a safety issue with the risk that bronchoconstriction can lead to problems during pressure changes that may lead to pulmonary barotrauma or in worst case scenarios to cerebral air gas embolisation How the array of substitute tests relates to real life scenarios for these individuals remains to be clearly defined However it would seem sensible to instigate a testing process whereby a gener c standard is introduced The concern here is that the sensitivity and specificity of the test is all important and whilst a highly sensitive test such as EVH would be helpful to determine risk it may lead to a significant level of false positive results which may exclude individuals from shortage branch specialties

Finally the testing regime that would best predict the development of asthma or worsening of respiratory health during service life remains to be fully determined To define this will require a large detailed prospective study of newly recruited service personnel who have undergone a detailed screening system on entry and who are then followed up for an appropriate time period Central to this would be the ability to exclude individuals at certain time points throughout service life

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Conclusions

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responses to the [illegible] tests available. It
is essential for the military to have a robust
entry level test [illegible] and this may require
[illegible] of a [illegible] screening in
recruits by objective challenge tests. There
needs to be an adequate entry standard both at
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Continuing the debate will be the
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Finally we need a large prospective cohort study of entry level recruits to determine the risk factors that predict the development of asthma during service life. This over time will allow the entry standard to be adjusted accordingly so that questions of employability and deployability are dependant on robust population specific peer reviewed data.

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J Royal Naval Medical Service 2010 96 2 92-95

Clinical

Case Study - Leprosy

A M Wood, C M Wood, J Bakker-Dyos

Abstract

We present the case of a 26 year old Indian base worker who attended the Role 2 enhanced hospital in Iraq with a case of leprosy. The patient presented four times over a 12 month period with non specific pain in the right hand and forearm combined with a large lesion of dry skin and reduced sensation in the forearm. A clinical diagnosis of leprosy was made, which was subsequently confirmed as paucibacillary leprosy by skin smears sent to the UK. It was not possible to treat the patient locally and a recommendation made to the patient's employer that the patient return to India to commence treatment.

Introduction

The World Health Organisation estimated that in 2009 the prevalence of leprosy was 213 036 cases worldwide with over 249 000 new cases presenting in 2009. Despite the fact that leprosy is treatable and patients rarely need to be kept in isolation, there is still a significant stigma and misunderstanding attached to leprosy. We present the case of a 26 year old Indian base worker who attended the Role 2 enhanced Hospital in Iraq with a case of leprosy. Whilst leprosy is not uncommon in the Indian subcontinent, we believe that we are reporting on the first incident of leprosy to present to a western field hospital since the start of OPERATIONS TELIC and HERRICK. Most UK doctors deploying to Iraq and Afghanistan will not have first hand experience of leprosy and the social issues that are associated with leprosy and we present a case that is of interest from a medical, operational and occupational viewpoint.

Case Study

26 year old Indian Cleaner employed by a civilian cor[illegible] es ove a 12 month [illegible] in tho ha[illegible] kin. He had prev[illegible] p incrure and ste[illegible] t e Dans[illegible] h an atacrr[illegible] ne ulna distr but on of [illegible]

On [illegible] d scussed with a other Do[illegible] or GP and the attendant Consultant Physician who specialised [illegible] ractious diseases. The patient was asked to parade at the Danish Camp a previous attempts to persuade the patient to attend the Military Hospital had failed.

The patient had no constitutional symptoms, no known leprous contacts, and although the patient came from the Indian Sub-continent he was from the Gujarat region which had recently been declared a leprosy free region. He had been living and working with in the British Logistic Base as a cleaner for one of the Civilian Contractors.

On Examination

There was a large skin lesion occupying most of the lateral border of the right forearm. It had a well circumscribed erythematous border.

Examination of the lesion demonstrated reduced sensation, dryness and lack of hair.

Additionally there was a palpable cord-like structure running down the medial aspect of the antecubital fossa.

There was also altered sensation on the medial aspect of the right forearm.

There was no motor or sensory involvement of the hand.

Examination of the peripheral nerves revealed no further areas of nerve thickening.

On the grounds of the classic skin lesion

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returned to India [illegible]
as advised.

His employers reaction was to terminate his contract immediately and the Danish attaion proceeded to put the patient into quarantine and then placed him on the first available flight to India.

Discussion

Despite global initiatives to eradicate leprosy it remains a significant global disease. In 2008 over 17 countries reported >1000 new cases of leprosy. These countries included India with 34,135 new cases in 2006. Likewise Pakistan had 830 new cases. Afghanistan had only 36 new cases and Iraq had no new cases reported which may represent a difficulty in detecting and reporting cases rather than a lower incidence. Whilst in the UK there were no reported cases of leprosy in 2009. As a result very few British doctors will have been exposed to leprosy.

As with this patient it is common for doctors not familiar with this condition to initially misdiagnose the condition. Although in late disease presentations there are significant deformities in early disease stages the signs and symptoms are very subtle and this is clearly demonstrated in a series of three patients presented by Hartzell et al 2005 where all three were initially misdiagnosed with another skin condition including contact dermatitis and tinea corporis as with our patient who was treated for dry skin and anaesthesia before being seen by a doctor who was familiar with leprosy. It is important to recognise leprosy early as rapid intervention can reduce the morbidity and disfigurement associated with the condition.

Presentation of Leprosy

Leprosy is a diffuse inflammatory disorder which can affect the skin, peripheral nerves, internal organs and mucous membranes.

The initial changes in the skin can be quite subtle and the patient may present with an area of skin which has been damaged due to the area being anaesthetic and after recovery the patient notices that the area is numb. The most frequently affected surfaces are the extensor surfaces and the area may initially present as a hypopigmented lesion which can be easily mistaken for a bruise. In multibacillary leprosy these areas may be macular, papular or plaque like in nature. In more severe cases nodules or ulcers may also develop which if infiltrated can develop into osteomyelitis.

Leprosy is the most common cause of non-traumatic peripheral neuropathy in the developing world. The patient may complain of sensory symptoms including pins and needles, burning sensations, shooting pains and restless legs. In the more severe cases and particularly in paucibacillary leprosy the patient may be thickened and resemble a thickened cord under the skin particularly where they cross over bones. The patients present with specific sensory and motor deficits. The most commonly affected nerves are the ulnar nerve and the resultant loss of motor function leads to the development of a claw hand. Other nerves frequently affected are the median nerve resulting in an ape hand deformity and the common peroneal nerve resulting in a foot drop. In patients with multibacillary leprosy the neurological disease is more diffuse and a symmetrical polyneuropathy is found later in the disease. The classical digital deformation traditionally associated with the disease is due to repetitive micro trauma to insensate digits and although leprosy is treatable care should be taken to protect insensate areas from further trauma.

The liver and lymph nodes can be affected by the infection and patients may present with hepatomegaly and lymphadenopathy. The mucous membranes of the eyes can be affected leading to glaucoma, testicles leading to infertility and larynx leading to a hoarse voice.

Categorisation of Leprosy

In order to treat leprosy [illegible] categorise the patient into [illegible] paucibacillary (tuberculoid) [illegible] (lepromatous) leprosy as [illegible] treatment regimes. If in [illegible] skin smears as with our patient [illegible] presence of bacilli in the sn[illegible] diagnosis multibacillary. However [illegible] an absence of bacilli from [illegible] then the patient can be diagnosed [illegible] paucibacillary and receive the appropriate treatment regime.

In some extreme cases military doctors may find themselves initiating treatment without the availability of smears. In these cases the World Health Organisation makes the assumption that in the absence of testing facilities the presence of six or more skin lesions makes the diagnosis multibacillary leprosy and patients with fewer than six lesions paucibacillary.

Treatment

In our case the patient was sent back to India by his employer whilst he lost his income as a result. This should not prevent him from getting the appropriate medication as it was established that access to medication to treat his leprosy was available in his home town free of charge. This is as a result of the fact that since 1995 the World Health Organisation has provided free multi drug therapy for the treatment of leprosy in all endemic countries.

The regime currently recommended depends upon whether the patient has paucibacillary or multibacillary leprosy. Patients who have paucibacillary leprosy are treated with rifampicin and dapsone whilst patients with multibacillary leprosy are treated with a combination of rifampicin, dapsone and clofazimine. The World Health Organisation strongly advises against treating leprosy with a monotherapy as it is likely to result in drug resistance.

Stigma of Leprosy

There is a long recorded history of the stigma associated with leprosy. In the Bible people with leprosy were regarded as unclean. Despite the fact that leprosy is treatable and curable treatment has been started the patient is [illegible] objective there is still a significant stigma associated with leprosy and there are still over 1000 leper colonies in India alone. Leprosy can take 3 months to 2 years to successfully treat and as a result it was not appropriate for the patient to remain in Iraq, however due to the stigma of leprosy the employer terminated his contract.

Throughout the consultation the patient was more concerned about being evicted from his community due to the diagnosis of leprosy rather than the actual disease. Practitioners should be aware of the sensitivities surrounding the diagnosis of leprosy particularly in poorer third world countries.

Summary

This case illustrates that although Leprosy is not common in Iraq or Afghanistan British medical officers should be aware that we currently employ base personnel from endemic regions and as a result may treat patients with leprosy.

As with this patient leprosy tends to present with skin lesions which are chronic despite medical intervention. They commonly present on the elbows, knees or ears and may be associated with areas of decreased sensation combined with a presence of thickened nervous tissue as with our patient and this may be associated with correspondent neurological deficits.

Finally medical officers should be aware that there is still a significant stigma attached to the diagnosis of leprosy and as a result they should be prepared for the social and financial issues created with the diagnosis and should be prepared to address these issues when dealing with a leprous patient.

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J Royal Naval Medical Service 2010 96 2 96-102

General

HMS ARK ROYAL and the 2003 helicopter crash in the Northern Arabian Gulf

A reflection on the psychological sequelae from the event and a theoretical model for mitigating the adverse psychological effects of body handling

R H Coetzee

At 0430 on 22 March 2003 two Royal Navy Sea King helicopters belonging to 849 Squadron based on HMS ARK ROYAL collided in mid air during OPERATION TELIC 1. All seven crewmen on board the helicopters lost their lives in this event. For the ship's company this was the beginning of this traumatic event and the body handling and bereavement that followed proved to have long lasting psychological effects on a number of the ship's company. The author was involved in treating four members of the ship's company who presented with Post Traumatic Stress Disorder (PTSD) and in the process built up a picture of how these individuals responded to a psychological level. This article will be a reflection on the trauma psychology of this event and the importance of diagnostic and treatment in the development of PTSD. Finally it will offer a new theoretical model for mitigating the adverse psychological stress.

Sowing the seeds

Every traumatic event has features of the event and person that apply to the period leading up to the event, during the event itself and in the aftermath that may contribute to the development of PTSD in some individuals. There were some features of this deployment that could have contributed to the vulnerability of some individuals. If one considers the features of a traumatic event that can render it more psychologically traumatic (Box 1). In addition it should be acknowledged that military operations are inherently risky.

In looking at the reports from these four individuals it is likely that some of these features had already emerged at the beginning of the deployment and that there were inherent and unavoidable. In the first instance there was great uncertainty about the nature of the threat that the ship would face. Contending with the standard conventional threats is a challenge for any Unit but there was the added threat of the use of chemical and biological agents which were more alien to them in terms of self-efficacy. Hence all four individuals described an increasing sense of threat to self and others coupled with a sense of vulnerability. Gradually they came into

1. Emotionally overwhelming
2. Loss of control
3. Helplessness
4. Personal attribution and responsibility for outcomes
5. Perceived catastrophic outcome
6. Sustained and inescapable stimulation
7. Void of information and predictability
8. Low sense of self efficacy in the face of the stressor

Box 1. Features of a traumatic event that may render it more psychologically traumatic

ouch with their own mortality and the prospect hat they might die or for the two senior ndividuals the prospect that those they are esponsible for might die. All four continued to unction in spite of the emotional experiences nd would have stayed with the Unit even if he opportunity arose to leave. However there ves no escape no control and no option but o go where events take them and this created strong sense of loss of control.

The sense of subjective threat described by hese individuals progressively increased as hey neared the Gulf. By the time they reached he Suez Canal they were in a state of sychological hyperarousal as were many of he crew members they saw and whose ctions they described. This is normal in erms of the fight or flight response. The mportance of this for them was that it ightened their hypervigilance which meant hat all threats were detected and analysed but ue to their perceived lack of self-efficacy and ontrol the threats could not be entirely rought into perspective. Over time the idiosyncratic meanings of I am going to die my friends are going to die and I am weak were seeded.

Crash

When the critical incident happened it was unexpected both in time and origin. It was ndom and it was difficult to make sense of it s the expectation was that the enemy would e the agents in loss of life. The sudden loss of e affected the member of the Air Squadron rofoundly. As an engineer he totally felt a trong sense of responsibility that something ad gone wrong with the aircraft and they as ngineers were responsible. As one of the ainor people it realised his fears that someone t whom he was responsible had died. His aumatic journey took him through potent motions of guilt and fear coupled with anger his perceived futility of the deployment that ad made the lives of seven men. The concept of idiosyncratic meaning will be discussed later in is paper but for him it was of personal failure ommment personal death death of those he was in charge of and of futility. He was not one he described others of the Air Squadron responding in the same way although no one talked openly about it.

For the other three individuals the traumatic experience revolved around body handling. This actually occurred twice in this deployment. The first was the handling of their colleagues bodies and the second those of an Iranian family whose fishing boat had sunk. There were a mixture of responses but all felt an intense perception of it could so easily have been me which brought into sharp relief previous lingering thoughts about dying. Two of these three individuals were directly involved in the manual aspects of body handling. The initial response was of shock and revulsion as the state of the bodies from the physical damage caused by the crash and a prolonged time in sea water should be appreciated. They both described how they saw other crew members struggling to cope for instance members of the first aid party crying and being sick. However they could not express any of the overwhelming emotions they felt as they had a job to do. As a result both spent most of the actual body handling incidents in a state of dissociation (defined as a dream like state where emotions are absent and the event feels unreal). Very quickly the traumatic idiosyncratic meanings took hold resulting in attributions of personal weakness culpability to cope and immanence of personal death. The remaining one of the three was involved in handling the personal effects of the deceased and preparing it for receipt by their families. For him it was the thought of what I would do to his family that became the most traumatic meaning and his beliefs centred around losing them and more importantly them losing him.

For all four of them the deployment continued and so did the adverse psychological circumstances in which they were rendered vulnerable to this experience and had to try and adapt to it. They all completed the deployment successfully but by that time the traumatic idiosyncratic meanings had been consolidated and PTSD symptoms established. The first of the four came into treatment three and a half years after the event. In terms of outcome all four were

[illegible] Desensitisation [illegible] harmful [illegible] behavioural [illegible] [illegible] Sadly, however, [illegible] [illegible]

[illegible] obvious and [illegible] relation to this issue. The ship was at sea constantly for five months and this is a stressful environment even when not in the midst of a conflict. The successful nature of this deployment was recognised and there were comprehensive drills and briefs in the run up to the period in the Gulf to assist mental preparedness. Due to the pre trauma templates and the seeding [illegible] of traumatic idiosyncratic meanings [illegible] the four individuals experienced these as a great enhancing but most likely added to the perception of self efficacy and control for the crew of the ship's company. In the [illegible] deliberate efforts at decompression [illegible] made with shore visits to Salalah and [illegible] along with an emphasis on sports and [illegible] events on board. Most importantly the [illegible] of the Command took a personal [illegible] and two of the individuals described how the LO personally asked after their wellbeing and checked on them subsequently in one case remembering to do so years after the event on a chance encounter. In other words, everything was done at the time within the doctrine and knowledge base that existed as Command sought to reduce the stress everyone was under with added personal interest and concern.

Idiosyncratic Meaning – the key to understanding PTSD

There were hundreds of people in the ship's company and yet only a few came to the attention of Royal Navy Mental Health Services. It is important to consider why this might be the case. It is likely that the answer lies in the concept of idiosyncratic meaning. In other words the personal meaning an individual attaches to a traumatic event. It can explain a number of mysteries and controversies in the field of PTSD. It is likely to explain why a group of people can witness the same horrific incident and only a minority develop PTSD. For instance, most were left with idiosyncratic meanings along the lines of "I survived" and "I did everything I could", whilst those who got PTSD thought "I could have died" or "it was my fault". This can also explain why some people can get PTSD after relatively minor stressors that others do not. Find traumatic at all. This is the subject of a vigorous debate in terms of meeting Criterion A in both the ICD and DSM IV that deals with the nature of the stressor.

However, the development of a traumatic idiosyncratic meaning frequently has its roots in early experiences that predate the traumatic event, not uncommonly by years. It is in early life experiences, traumatic and emotional, that templates are formed that will predict the response. However, for each individual the mix of features needed in terms of the pre morbid templates and the nature of the stressor to precipitate PTSD vary widely and is essentially unpredictable. This is probably why mass pre-trauma screening is of little value. A lot of work has been done on identifying risk factors that can predict those at high risk of PTSD, but they are not specific enough to allow us to accurately screen out those at risk without risking significant false positive and false negative results.

Adaptive Meaning Construction

As yet, we have not found a clear solution to the problem of preventing trauma related psychiatric morbidity or minimalising symptoms when they arise so that trauma related disorders do not develop. In the Royal Navy we attempt to manage this risk through the use of pre- and post-deployment briefings as well as the peer-led psycho educational program TRiM (Trauma Risk Management). These interventions have shown some positive benefits and is the subject of further research and development. Post deployment briefs have been associated with a beneficial effect on outcomes (1, 2) and TRiM has yielded some

benefits in the areas of occupational functioning and stigma reduction (3 4). However, it is likely that once pervasive traumatic idiosyncratic meanings have been established leading to symptoms, that a specialised and specific psychological intervention will be required (5). It is unlikely that there will be a single silver bullet that will resolve this issue and it is also unlikely that it is an issue that can ever be resolved completely. However it is likely that at least some mitigation can be achieved through interventions in this area, albeit that we have had modest success so far.

Adaptive Meaning Construction is a theoretical concept and is an intra-trauma intervention as opposed to the pre- and post trauma interventions above. It is aimed at reducing the sense of helplessness and loss of control as well as striving to introduce more adaptive idiosyncratic meaning frameworks. It [illegible] this additional intervention [illegible] components. Executive [illegible] Adaptive Meaning Construction [illegible] especially in mixed at sea [illegible] at sea [illegible] life environmental circumstances [illegible] other arenas, although the principles [illegible] in the same.

Executive Control

It is deemed important that this model that there be an appropriately trained Officer who can direct the body handling and who has an understanding of the issues involved. In other words, someone who can co-ordinate the body handling and introduce a sense of control, goal directedness and procedure. This is in fact considered the most important part of the intervention as it removes the randomness of the allocation of this role to a specific training individual. The proposed roles of the Body Handling Co-ordinator are summarised in Box 2.

1. Organise body handling parties based on true volunteering and have knowledge on how to recruit true volunteers
2. Ensure that Adaptive Meaning Construction briefings take place either personally or by directing Chaplains or CO
3. Reduce exposure to essential personnel only
4. Ensure that there are sufficient body bags, lifting equipment, storage spaces and other logistical arrangements in place. Much of this can be done in contingency planning against the noted
5. Organise regular rotation of volunteers
6. Co-ordinate the high visibility of key figures such as the Chaplain and CO, whilst personally being visible throughout
7. Be familiar with and brief volunteers precisely and confidently on the physical procedures and logistics of body handling
8. Ensure that the details of all individuals involved in the body handling, not forgetting the photographers and those handling personal effects, are recorded and the Body Handling Co-ordinator takes ownership of this list locally
9. Early intervention by removing those from the body handling party who show signs of undue distress, but tolerating normal adaptive emotional responses
10. Directing Chaplains, medics, MOs and TRM practitioners to specifically check on the well being of handlers in the days and weeks after the event, depending on availability of those groups. This would be in addition to checks made by the Body Handling Co-ordinator personally
11. Ensure that all individuals on the list that were involved in the body handling are tracked and that enquiries are made after their well being 3 months after the event. Once again this check can be made personally if circumstances allow or through Chaplaincy, MOs or TRM practitioners. The absolute is that the Body Handling Co-ordinator must personally ensure that it happens particularly if the individual has moved on

Box 2: Envisaged roles of the Body Handling Co-ordinator

These m en a [illegible] trained and [illegible] running r [illegible] deploying [illegible] Body Handing Co ord [illegible] og st cal training and training r rte psychology of body handling in order to understand Adapt ve Meaning Construction they should also be prepared for body handling themselves This can be achieved through photographs but more mportantly by attending an actual autopsy or cadaver dissection to ensure they acquire their own protect on against traumatic id osyncratic meanings It follows that the Officers that attend th s course must be true volunteers t emselves for reasons stated below

Adaptive Meaning Construction

Th s s the psychological component where one t ves to intervene at source n the formation of traumatic d osyncratic meanings Th s rs based a ound the protect ve factors of Executive direction and control stated above true volunteering and the introduction of adapt ve meaning frameworks

True Volunteering

In the Armed Forces it may be that conflict arises between personal needs and task needs when volunteers are requested for unpleasant tasks It s poss ble that the fear of facing overt and covert career consequences f you weigh the voluntary decision in favour of your personal needs can make some personnel feel obliged to volunteer It could also be in some cases that volunteering s but token and in truth personnel are s mply told to complete the task To a large extent th s culture s benef cial in the Armed Forces due to the urgency of task needs but in body handling it may not be you are volunteered as opposed to volunteering a likely important and robust [illegible] or psychological defence is [illegible] stripped away A pressed man or [illegible] offers the protection of knowing that [illegible] made by personal choice and the [illegible] of control and self efficacy that th s [illegible] This volunteer body handling party can [illegible] actively recruited at the beginning of the deployment but t is important that the Adaptive Meaning Construction brief be given at the t me of the body handling

Construction of Adaptive Meaning Frameworks

This is an important part of the proposed intervention It aims to introduce a more adaptive and egosyntonic meaning to the act of body handling It attempts to move the meaning and focus away from the horror and fear associated with the act by reframing it in terms of the positive purpose of the act It introduces solemnity virtue selflessness and meaningful sacrifice by the handlers and acknowledges that the help is valued and the sacrifice recognised It is best delivered by someone from whom these words carries weight such as the CO the Chaplain or the Body Handling Co-ordinator by virtue of the fact that he/she s doing it with them and will remain present An example of such a proposed brief s detailed n Box 3 It must remembered that outside the solemnity and emotional environment of the traumatic event, these words may sound melodramatic and even corny However n the context of the solemnity of the event and the leadership shown m acknowledging that it rs an emotional task it can become very powerful and meaningful

It s proposed that the brief follows the following structural principles

1 Thank them for volunteering
2 Acknowledge that it was difficult and that you appreciate it
3 Give them the factual information and what to expect but don t overplay the state of the bodies or unpleasantness
4 Remind them that these are human beings who are now in need of care
5 Introduce a meaning that makes their sacrifice an act of selflessness and courage and so cast them in a positive light
6 Invoke their role as n loved ones to add further meaning to the sacrifice
7 Maintain an atmosphere of solemnity and dignity It should become ritualistic and cleansing

It s important to note that sometimes body handling occurs with no notice m

Hello all. First of all, thank you for volunteering for this task. I know it took a lot for you to do so and I appreciate it. As you are now all aware, two of our Sea Kings have collided and it looks like we have lost all seven people onboard. You have been asked to help because we know that they have recovered some of the bodies and they are being brought to the ship. These men were our friends and colleagues, and that is what they still are, but now their bodies are broken and have been in the water for some time. This means it is a task which will not be pleasant, and will ask a lot of us. We may very well decide to dwell on the unpleasantness but that will not help us today. You see, you are not here today to merely handle these bodies. You are here to give them one last precious gift. They need us to send last bit of the road with them, so that we may, on their behalf, to their loved ones. We are here to do it for them. We are standing here in their stead. We are going to take those bodies and we are going to treat them with calm dignity and tenderness. We are going to remember that they remain our friends, and we are going to honour their sacrifice. We are going to do this honourable thing for them, and in doing so we will find peace in our own hearts. Because we put their last needs above our own interests, we will not [illegible] today as an unpleasant task, but as our highest duty to our fallen comrades. On behalf of them and their loved ones, I thank you for being here and helping in this today.

Now, this is how we are going to do this.

Any questions?

If appropriate, the Chaplain can then lead in a short prayer or reflection before [illegible] commences.

Box 3. Example of an Adaptive Meaning Construction brief

emergencies. This can of course not be prevented in combat or emergency scenarios. However, most of the body handling occurs in the aftermath, when the normal and mostly protective fright or flight response has diminished. The risk that needs to be evaluated in this model is whether it can disrupt healthy and normal coping mechanisms as an unintended effect.

Conclusion

Body handling, as demonstrated by the HMS ARK ROYAL helicopter crash, remains an unresolved issue for the Royal Navy and all Armed Forces, and can be a source of significant psychological morbidity. Interventions pre- and post-trauma have shown to be of some value thus far, and is the subject of ongoing research. Adaptive Meaning Construction is a theoretical model based on intra-trauma intervention, primarily in the Executive sphere. It strives to [illegible] formation of maladaptive [illegible] meanings, which is a key contributor [illegible] development of PTSD and other psychological responses to traumatic stress. More work is needed on translating [illegible] model into practical reality and [illegible] that it is tested for [illegible] to ensure that it does indeed have a significant difference to [illegible] handling.

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Acknowledgements

The author is grateful to the four individuals who are the subject of this paper who perused drafts of this paper and gave invaluable feedback and consent for publication In addition the author would like to thank Surg Cdr J Sharpley RN Surg Cdr N Greenberg RN Lt(O) Matthew Wesson RN and Dr Matthew Gould for their advice and critique on drafts of this paper

Declaration of interests

None

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General

Notes from a small Scottish training scheme

P J B Coates

I assume you won't be planning on wearing uniform. If you were to be appointed as a SpR at Ninewells, Philip? enquired my future head of Training. This was in May 2009 and I was making an initial visit to the Radiology Department at Ninewells Hospital, Dundee where I was to spend the next 5 years. The Department had no experience of having a military SpR previously and were rather perplexed as to why I should wish to move from Plymouth to train on the east coast of Scotland.

Having completed 3 years of Basic Surgical Training in Derriford I had always hoped to stay in Plymouth for Radiology training. This was prior to the introduction of the Radiology Academies which offered a new way of delivering the perceived increased requirements for Clinical Radiologists. Trainees were to spend time out of hospital being taught from electronic learning databases and validated image archive. The flagship Radiology Academy was planned for Plymouth and was to open its doors in 2005. Having a short attention span for computer-based learning I decided this was not for me and started my search for a more traditional training programme. At the time the East of Scotland Deanery was advertising several positions. I therefore tentatively broached the subject with my wife of a 600 mile move north of the border. The obvious appeal was opportunities for decent hill walking and guaranteed snow. From a South West of England perspective our initial preconceptions of Dundee were of a sweet little Scottish town with little old ladies baking fruit cakes. This illusion was slightly shattered by the reality of a city with areas of deprivation (albeit with adjacent areas of affluence eg Perthshire, NE Fife, Highlands of Scotland, Angus, Aberdeenshire and Highlands and Islands). On a more positive note the scenery and [illegible] with excellent opportunities for hill walking, [illegible] Skiing, Avon [illegible] and [illegible] HAT Lecture [illegible] coasts, seven [illegible]. The [illegible] of [illegible] Please [illegible] a look at the [illegible] property market and ultimately we moved [illegible] in the local [illegible] in Perthshire.

The first year of Radiology training can [illegible] a [illegible] I carried a bleep but I never went [illegible] once over the first 12 months. We spent a lot of time in darkened rooms feeling slightly detached from the rest of the hospital. My sense of real involvement in the day-to-day running of the hospital began only when I joined the on call rota in the second year. There was clearly a cultural shift needed as I moved further into the darkside / darkness. We spent time in MRI and CT from day one which I found both fascinating and perplexing. We concentrated on learning the (now dying) art of barium enemas, swallows and performing ultrasounds.

My initial impression of NHS Scotland was of a system with a greater capacity which was not as overstretched as its English counterpart. Whereas a typical ultrasound list in England may be very heavily booked with short scan times in many centres, we would have no more than 8 patients. This was good from the training perspective with regard to having sufficient time to acquire the necessary skills. On the flip side less throughput implies less exposure to the range of pathologies one might expect to encounter in a 5 year training

[illegible]

[illegible] changed [illegible] corporate [illegible] health lists become [illegible] the emphasis is [illegible] on the 18 week wait and the [illegible] managerial and clinical priorities.

It is useful at this [illegible] understand some of the differences [illegible] the English and Scottish Healthcare systems and how these differences have [illegible] evolution.

Scottish Devolution [illegible] on 1 July 1999 and following this there has been a divergence of healthcare policy [illegible] the two. The devolved Scottish Government is responsible for all cultural aspirational elements of the economy public services and delivery of healthcare. Free Personal Care for the elderly was a flagship policy of the [illegible] / LD Democratic devolved [illegible] from a drive for the taxpayer or [illegible] operation. The cost is rising and [illegible] overall even north of the border.

It is worth remembering that there has not been fiscal devolution at this stage as NHS funding is drawn from UK wide national insurance contributions and taxation. In effect there are two different mechanisms for allocating NHS budgets (1) one for England and the other for the devolved countries. The Scottish government are allocated a sum of money for devolved services based on the Barnett Formula and negotiation with the Treasury. The Scottish Government then determines how much of this lump sum will be spent on healthcare. The Barnett Formula (2) is used to adjust the spending plans of the three territorial departments (ie Scotland Wales and Northern Ireland). Whilst it is not intended to reflect need in a country it does reflect the situation of increased public spending per capita in Scotland as compared to England.

The Scottish Government abandoned the purchaser/provider split shortly after devolution (3) and the different policy approaches between the two countries have been characterised as based on markets and management (England) and the medical business and cooperation (Scotland) by Professor Scott Greer of the University of Michigan. English concepts of tendering choose and book and market style incentivisation have not been embraced north of the border where the emphasis is more on multi professional teams and a more cooperative approach. There is no such thing as Payment by Results in Scotland and no PCTs (instead there are Community Health Partnerships).

The challenges are different as compared to England as a whole there are higher levels of deprivation and poorer health in Scotland. Overall the population is falling and is now thought to be just under 5 million but with a greater proportion of elderly people as elsewhere in the UK. The Scots have always had a strong sense of national identity and further changes followed devolution as NHS Scotland began to further define itself as a very different organisation. In 2003 the Scottish Executive (Scotland) Act abolished trusts and their role was taken on by Health Boards whose remit is to provide a unified service. There are 14 geographic Health Boards across Scotland with a further 8 Special Health Boards (including NHS 24 the equivalent of NHS Direct the ambulance service a board responsible for Quality Improvement and another for waiting times). 158 000 people are currently employed by NHS Scotland which includes 12 000 Doctors and GPs 3 800 Consultants and 47500 nurses midwives and health visitors.

Managed Clinical Networks are also a cornerstone of Scottish policy which are designed to link formally a group of specialists in an area. Reporting to the Health Board MCNs agree the service delivery and changes for which they are accountable (4) and have a

linical lead [illegible] in a annual report. The role of MCNs [illegible] a group of clinicians with [illegible] interest for instance vascular services [illegible] epilepsy and help them cooperate [illegible] different parts of the NHS. At [illegible] Vascular Surgery [illegible] managed [illegible] clinical network covering [illegible] Tayside Vascular Surgeons from Dundee [illegible] Perth and Dundee participate in emergency cover centred on Ninewells. The [illegible] lead [illegible] recently was an Interventional Radiologist from Ninewells and Radiology is very [illegible] involved in the Clinical Network.

The Scottish model is very personal and smaller one where it is easier to get things done. However it is also more hierarchical and centralised than the English and there are now some striking differences between the two systems in terms of outcomes and delivery of healthcare. According to the Nuffield Trust (1) a 6% additional level of funding per capita (compared to the North East of England) has resulted in 14% more hospital doctors and GPs, nearly 50% more nurses and 15% more non-clinical staff. Further analysis of productivity (using NE England as the closest comparable English region to Scotland) yields a doctor in the North East of England could treat 60% more outpatients, care for 30% more inpatients and perform 100% more day case operations (1). Arguably the balance may lie somewhere between the two: the North East of England is probably relatively under-doctored.

Interestingly, whilst the UK taxpayer funds all of this, only the English NHS regions are directly accountable to the Treasury, as funding in England depends on performance against the Treasury's Public Service Agreement (PSA) targets. No PSA targets have been set for devolved administrations since 2007 so in stark contrast to England, the funding in Scotland is controlled by the Scottish Government and not dependent on PSA targets. At this stage of devolution it would be difficult to reverse this in Scotland and the Treasury is unable to hold devolved administration accountable for their performance through targets. Collection of [illegible] is variable [illegible] is difficult to [illegible] money between [illegible]

[illegible] Ninewells certainly [illegible] and clean [illegible] in a round [illegible] the rest of Tayside [illegible] that the hospital has [illegible] to services and [illegible] gastroscopic surgery [illegible] through the work of [illegible] Dundee covered [illegible] University of [illegible] cases. Radiology department currently has 2 MR scanners and 2 64 slice CT scanners, with additional MRI and CT scanners provided by neighbouring Perth Royal Infirmary and Stracathro hospital located 40 miles to the north of Dundee. Additionally there is a Clinical Research Centre at Ninewells, which has a 3 Tesla MRI scanner (extensibly for research work) and a PET CT scanner has recently been opened. All patient images are archived locally and sent to a Scotland wide national PACS server. This has proved a very worthwhile project, as a patient visiting Tayside who originated in Glasgow can have all recent images viewed by us and attached reports. A similar project in England is difficult to imagine given the larger numbers of patients involved and the necessary size of servers. It could only really be undertaken in a regional setting.

When we first moved to Scotland I was very aware that I had moved to a very civilian environment and maintaining service ethos could be a challenge. Initially the naval component at Ninewells included myself and Surg Lt Cdr Simon Mackie (Urology SpR). Simon departed and Surg Lt Cdr Jamie Welch (Opthalmology SpR) joined me. From the outset Jamie wore uniform to work but at that stage I still wore civilian clothes. Feeling slightly isolated from the day-to-day RN, I decided to follow suit, which necessitated some negotiation with my consultants. This certainly helped to remind me that I am in a fighting service and proved to be a very visible promotion of the RN in a coastal city with little

naval tradition. Th[illegible] confusion with a[illegible] patients, but most [illegible] positive and seem[illegible] have a service do[illegible] only drawback [illegible]

At the start of [illegible] had a visit [illegible] base and his des[illegible] closing links between [illegible] and Ken. An edu[illegible] could let identify [illegible] The [illegible] hospital [illegible] individually a d[illegible] [illegible] completely [illegible] [illegible] 2005 [illegible] Short in Corning D[illegible] [illegible] a surprise [illegible] completely attack [illegible] [illegible] have been an immersion [illegible] [illegible] edics in DPM (and one naval [illegible] [illegible] local Shirt and black trouser) [illegible] Gordons, followed by Str[illegible] [illegible] said to say we moved house a[illegible] [illegible] graphical and on-call constraints [illegible] [illegible] went again. It did achieve [illegible] [illegible] me in touch with local TA [illegible] [illegible] has proved valuable at times.

Having passed my Physics exa[illegible] [illegible] I went on to the trauma of Part 2. This comprised 6 months on the [illegible] [illegible] during the 2nd and 3rd years. The [illegible] changed and the part 1 exam is now [illegible] computer based anatomy and physiology [illegible] knowledge of anatomy [illegible] [illegible] dates. Part 2A now [illegible] [illegible] now. The exit exam is [illegible] 2B usually sat in the 4th year. This [illegible] A&E [illegible] reporting, long written [illegible] 12 years. In recent years it has had a [illegible] and remains a [illegible]

[illegible] I [illegible] expressed to running [illegible] (Part 1 to paying all) and [illegible] I also became fascinated by [illegible] Interventional Radiology in [illegible] subspecialising. In the future [illegible] any particular but such changes are still on the horizon. I also spent 6 months in Edinburgh with time in Paediatric Radiology and Neuro Radiology.

More recently I have been back on the wards again. To the horror / surprise of some of my Radiology colleagues. For 2 days a week I transformed into a Vascular Surgery registrar, whilst my opposite number in Vascular Surgery [illegible] on some of my interventional work. I attended ward rounds, Outpatient Clinics and theatre lists. Several weeks ago I performed a angiogram during (Radiology) on call on a Friday day and then performed a below knee amputation on the same patient the following day. Please note previous comments about surgical training. I did pass the MRCS exam (obviously!). This has reminded me of how much I have grown to love my own specialty and how sheltered I am from the more negative aspects of ward based disciplines. In terms of my Radiology the skills (re)gained from this will be of value in running my own clinics in the future and speaking the same language as Vascular Surgeons. When you attempt to salvage a dialysis fistula with a fistuloplasty it certainly helps to have performed the operation yourself several times as it provides a greater insight into the potential technical challenges. This is the way future Radiology training may be going, with plans afoot for trainees to spend more time in related disciplines appropriate to their subspecialty (eg a trainee subspecialising in Urology may spend time with Urologists and Renal Physicians in the future).

Conclusion

CCT is now approaching fast and with a move to Birmingham in August 2010 and an operational tour in December. I have had time to reflect on my 5 years in Scotland. Training in Scotland has been enjoyable and I feel I have benefited in ways I had not anticipated. I have undoubtedly experienced a medical system which (in Tayside at least) is less stretched than its English counterpart and has a slightly more relaxed feel. I have had a very broad training with more emphasis on medical education than service provision. In my final year I am now experienced enough to increase the

volume and speed at which I work to successfully move back into the frenetic pace of the English NHS. At times I have felt a little isolated from the RN but the very supportive staff at INM have proved invaluable in keeping me up to date and reassuring me that I have not been entirely forgotten. Regular attendance at the INM Seconded Medical Personnel Symposium has proved invaluable for keeping a weather eye on changes in the services as well as meeting up with old friends. In recent times I have noticed a shift in attitudes to wearing uniforms and many of the RN centres in Scotland now provide a very visible presence of the RN in Scottish hospitals. This must help maintain service ethos and should be seen as a positive move.

I still believe a military Registrar in a civilian department can be a blessing (!) as we can provide a slightly older pair of hands with some management background (eg good at organising rotas and taking gripes from our civilian colleagues to management), experience in primary care and a slightly more mature approach. Much of this obviously stems from having worked outside the NHS for 3 years working in the NHS but not being employed by the NHS. I have certainly worked as an intermediary on several occasions where there has been potential conflict. My relative independence has been seen as an asset in negotiations on behalf of colleagues (eg not be[illegible] [illegible] ss ons about rota [illegible]

[illegible] though as a family [illegible] d a struggle to [illegible] in rural Scotland [illegible] south and on deployment [illegible] down challenges [illegible] having trained [illegible] and East of Scotland Deanery to [illegible]

Acknowledgements

Thanks to Dr John Blundell, Radiologist, Ninewells Hospital, Dundee, who reviewed the manuscript.

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J Royal Naval Medical Service 2010; 96(2): 108-116

History

'Performing Miracles': The Importance of Royal Naval Medical Officers in Operations 'Overlord' and 'Neptune' During World War II

S A Preece

The D-Day landings of World War II on 6 June 1944, involving the landing of over 156,000 troops along the French coastline, called the Battle of both Operation Overlord, the Allied invasion of north-west Europe, and Operation Neptune, the assault phase of the campaign (1). Confronted by German forces holding defensive positions, it was inevitable that there would be a large number of casualties and therefore a need for medical services, supplied primarily by the Royal Army Medical Corps (RAMC) and, in the Royal Naval Medical Service, to provide both emergency and ongoing treatment of the many wounded. Much has been written about the Army's medical role in World War II, including *Medicine and Victory* (2) by M Harrison, but the majority of work regarding Royal Naval medicine focuses on World War I, such as the books *The War on the Hospital Ships 1914-1918* (3) by Stephen McGreal and *Hospital Ships and Ambulance Trains* (4) by J H Bridge. For information about the Royal Navy in the Second World War, the work of Dr S Coulter is the only detailed account of the operations and therefore is the most authoritative. The role of medical officers in the D-Day and ongoing covered extensively in Coulter's history, *The History of the Second World War: The Royal Naval Medical Service* (5) published in 1953 and 1955. Coulter covers all aspects of medical care by the Royal Navy throughout the operations in great detail and his conclusion is that the role of Royal Naval medical officers was relatively under compared to that of the Royal Army Medical Corps. However, more government and military papers have become available to the public since the publication of the books which provide further insight into the workings of the Royal Naval medical officers during the campaign. Using this new information, I was able to analyse the role of the medical officers of the Royal Navy throughout the operations, focusing on their work both at sea in small craft and ships, as well as ashore in both France and the United Kingdom. From the research carried out, I can conclude that the naval medics were at least as important as their Army colleagues, if not more so, particularly in the early phases of the assault. The conclusions of this study therefore contrast with the opinion of Coulter in the official history written over half a century ago.

Landing Ships (Tank): Critical Care

The preparations for Operation Overlord were extensive and some thought had been given to the number of expected casualties. A government estimate for D-Day itself numbered 2600 casualties, with another 10,950 expected in the following week (6). With little Allied medical assistance available ashore in the early stages of the assault, it was decided that casualties should be evacuated to the United Kingdom for further treatment in the same craft the troops were landed in: 70 Landing Ships (Tank) or LSTs (7). These were chosen over the larger better equipped hospital ships as the German forces had shown disregard for the Geneva Convention on previous occasions, both during World War I and at Dunkirk in 1940 when two clearly marked hospital carriers, SS Worthing and SS Paris, were attacked in broad

daylight and seriously damaged the craft (8). This was despite a warning being sent to the enemy asking that the convention be respected (9). As a consequence of this the Allies expected similar attacks and were unwilling to take the same risks in a preparation of a larger scale. Another reason for the use of small craft was that senior military figures had predicted that in the early phases of the operation it would be impossible for larger vessels to dock as there would be no quays available at which to moor and load casualties (10).

The 70 small ships were divided between the main two medical services. 40 of the LSTs were to be medically manned by the Royal Navy (11). The service was responsible for supplying three medical officers, including a surgeon, an anaesthetist and a doctor trained in resuscitation (12) as well as sick berth attendants to tend to the many wounded on their journey across the English Channel (13). The other 30 were manned by members of the Royal Army Medical Corps (14). Before the craft could be used they had to be modified for the purpose of casualty evacuation and so were supplied with drugs and equipment (15) such as resuscitation apparatus and blood products including serum and full blood (16). In addition they were fitted with 144 adjustable stretcher racks (17) around the bulkheads (18) allowing the craft to carry a total of up to 320 wounded personnel(19) and an emergency operating theatre was constructed at the rear of each craft to perform critical surgery during the return to the United Kingdom (20). Following the embarkation of the troops at the Normandy beaches, code-named Gold, Juno and Sword, the medically-trained members of the crew were responsible for preparing the tank deck and setting up the medical equipment ready to receive the first wounded (21). This was a task that had to be performed without hesitation as casualties resulting from enemy fire could be expected immediately upon landing. This was an important role as it was necessary to be organised for the receipt of the large number of wounded men so that medical treatment could be carried out effectively. Highlighting just one of the ways in which Royal Naval medical [illegible] the [illegible] 800 [illegible] June [illegible] craft were [illegible] Airborne Div[illegible] been dropped [illegible] and the previous night. They were treated by the medical staff of LST 423 (23). On this occasion it was necessary for the medical teams to administer not only the basic replacement of field dressings but also some wonderful life saving operations (24) showing the differences in severity of injuries sustained in the earliest stages of the invasion. In the ensuing days the number of casualties received by the officers on LSTs increased rapidly as detailed by Surgeon Lieutenant Arith who noted the casualties received in his diary. On June 12, after a four day gap in the diary due to the influx of patients he recorded: Got sixty casualties in the first rush and expected another four hundred (25). With only three medical officers on board the craft, the sheer volume of wounded soldiers is likely to have caused chaos as the officers were forced to decide which men to try to save. Yet with clarity of mind and an ability to work effectively under pressure, the medical officers were able to work successfully.

Almost all cases seen by medical staff on LSTs in the first period of the assault were trauma cases. Surgeon Lieutenant Arith wrote about some of the cases he worked on in his diary:

There were some ghastly injuries: we got the theatre going immediately and removed many pieces of shrapnel. The most massive effort was for an amputation through the thigh for gas gangrene. But the poor fellow was too far gone, despite several pints of blood, he did not rally (26).

Despite this unfortunate case, the medical officers managed to successfully treat many others and save the lives of several soldiers, including one man who was suffering from a serious haemorrhage from a compound fracture of the femur (27). The patient was apparently:

moribund on arrival, but he was completely revived after four pints of whole

blood fo[illegible]
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The m[illegible] only had t[illegible] y hou[illegible] they a[illegible] ope[illegible] [illegible] ile officer [illegible] LSTs had resp[illegible]ty for medical [illegible] p[illegible] the waterline o[illegible] the beaches (29) meaning that they too came under enemy fire as they tried to collect casualties from the water. This greatly affected the officers, as illustrated by the first entry in the diary of Surgeon Lieutenant Arth on June 6:

This has indeed been D-Day. Dawned Day. Death Day. Destruction Day. Disappointment and Disillusion Day. I have seen men die suddenly, horribly. I have twice been near death myself, so near that I desperately wish to forget, but probably will never do so (30)

The medical officers on board LSTs remained crucial as long as the Army had not fully established adequate care ashore. It can be seen at the beginning that treatment had been chaotic and sometimes unsatisfactory. Arth suggested that morphia had been plentiful, but treatment non existent (31) and another medical officer claimed that they found it necessary to apply a large number of plasters – plasters which had been hastily applied elsewhere (32). This shows the inadequacy of care inland and therefore the importance of treatment at sea by the Royal Naval medical officers in the early phases of the operations. Over time, the Royal Army Medical Corps lines-lines on the Continent improved as the Allied forces became more established and so the cases seen by staff on the LSTs became less traumatic and the procedures became more medical. These included treatments such as taking off half a pint of fluid from one man's chest, and doing a lumbar puncture (33). Whilst this work was still important, these procedures could be carried out by staff on hospital carriers and hospital ships which could come alongside once the clearing and cleaned Mulberry harbours had been towed across from England and set up (34). Therefore medical teams were steadily released from duty to return to England (35), leaving the Army and hospital ships to deal with the wounded for the rest of the operation, suggesting that the services provided by the LSTs became redundant (36) over time.

Hospital Ships: The Later Stages

The other main type of vessel used was the hospital ship, although they did not have a significant role at the beginning of the campaign as there was nowhere for them to come alongside until the Mulberry harbours were fully functioning. These had a limited capacity for patients and casualties could not be embarked directly from the shore, so the wounded had to first be loaded onto Landing Craft Personnel (Small) which then carried the soldiers to the carrier when the tide was favourable (37). Landing Craft Personnel Air-Cushioned (LCPAs) were also used as water ambulances, which could carry six or seven stretcher cases at a time to the carriers waiting off shore (38). It was planned that hospital ships, including the converted passenger ferry, HS Duke of Lancaster (39), were rostered to visit each of the beaches. However, when D-Day arrived, only two hospital ships were available: HS Isle of Jersey was the main hospital ship attached to the invading fleet (40) and she began to load casualties on 9 June (41).

Hospital ships and carriers remained of importance throughout the duration of the campaign. The carrier Duke of Argyll was docked at Arromanches on August 12, over two months into Operation Overlord, for a final embarkation (42). Commencing at 1200 hours, the casualties were loaded continuously onto the ship for over three hours with over 70 stretcher cases being embarked in the first hour alone (43). In total, 394 injured men were put onto the ship, of which 209 were stretcher bound (44). Although it is not clear what extent of treatment was received by the wounded soldiers on board, it is certain that the medical officers would have been busy attending to the patients and ensuring their comfort throughout the journey. This shows another aspect of care undertaken by the Royal Naval medical officers and underlines their importance in various locations during the assault.

It is clear that hospital carriers were crucial in the successful management of casualties as any wounded were treated onboard by hard working and determined medical officers However on each of the occasions that hospital ships could be boarded by the injured the vessels could not stay long as they were short of fuel and water (46) For this reason it is possible that the ships were not full to capacity each time With so few of these ships used during the campaign and limited time available for the loading of casualties this method of casualty treatment and evacuation can be seen to be less important than the LSTs as the majority of cases were treated elsewhere

Other Ships Additional Support

The majority of Royal Naval medical assistance took place on board the LSTs hospital carriers and hospital ships but other ships in the area at the time also carried medical officers who were involved in providing care for the wounded The main ship of the operations was HMS Largs the flagship of Force S which controlled the landings on Sword Beach On this ship active medical participation began at 0730 on Sword Beach when the crew required treatment for cold and exposure (46) but it was not long before the medical team was inundated with wounded soldiers As the flagship of the fleet the majority of small craft transported casualties to the carrier resulting in the entire staff of the ship being engaged within or away from the ship all day (47) This included Surgeon Lieutenant Manow who worked exceptionally long hours In one instance treating 47 wounded men in a 36-hour period (48) Long periods of work throughout the fleet were certainly not uncommon with an example of continuous operation carried out following the hailing of SS Demetrion on 21 June Unable to transfer or land the 29 wounded soldiers the force Medical Officer and the medical officer of HMS Largs were forced to undertake all treatment procedures themselves operating in a converted dining saloon from 1350 hours until 0200 (49) This was the longest unbroken spell of pure operation carried out by the officers during the campaign

Other ships with medical officers onboard [illegible] battles included [illegible] Valiant [illegible] off the Eastern Task Force (50) This ship was attached to the Normandy landings for the purpose of providing fire support at the beaches (51) yet according to Surgeon Lieutenant Commander Channell who was the designated medical officer of the vessel the ship also served as a reception centre for casualties (52) Records show that survivors were commonly accommodated onboard following the loss of a ship such as HMS Lawford which left 106 survivors of which only seven were wounded (53) Although there were relatively few casualties on this occasion there are many injuries that could be sustained from being in the sea such as shock hypothermia and immersion foot a syndrome occurring in survivors from shipwreck whose extremities had been exposed to the effects of the cold sea water for long periods of time (54) As a result the medical officer would always expect incidence of these conditions and would have been responsible for ensuring that any other survivors collected from the water were not suffering symptoms of these illnesses For this reason it is likely that the medical staff would have had to have dealt with several cases in a short period of time It appears the staff handled such situations well as Channell's work throughout the operations was deemed so worthy of praise that he was mentioned in dispatches for outstanding conduct during the conflict (55)

The cruiser HMS Belfast was also involved in several medical incidents from 6 June to 8 June although it sustained no casualties itself during the bombardment of the Normandy coast (56) The majority of casualties received by the medical officers were from landing craft which had been attacked by enemy fire during the landings including seven wounded soldiers who were transferred to HMS Orion following treatment (57) Other patients recorded include the crew of a craft transporting landmines from the beaches and 14 casualties from HMS Swift which was damaged by mines and sunk (58) All of the patients once treated were loaded onto the LSTs for the journey to the United Kingdom Although responsible for their immediate care

[illegible] involved [illegible] officers were [illegible] for treating any wounded resulting [illegible] enemy attack. One such ship was HMS Nith. Heavily attacked at night by German aircraft, the ship was eventually hit on June 23 by a pilotless plane (59). The explosion caused temporary failure of the lighting, such that first aid and resuscitation had to be carried out by torchlight (60). The medical officer managed to deal with the 26 wounded personnel by 0300 (61) a remarkable feat with poor visibility, ensuring that the sailors were able to resume their duties as soon as possible.

France: Assisting the R A M C

Royal Naval medical officers, although based ormainly at sea, also carried out important work on land. Throughout the campaign medical officers from the landing craft and ships were able to disembark and use their skills on the French mainland, aiding their Army colleagues. In the first few days of Operation Overlord, there appeared to be little need for the extra assistance, with reports from the medical officer with RNO Ouistreham of little to do ashore on June 8 (62). However, the next day, Surgeon Lieutenant-Commander Gillespie visited the temporary emergency camp and stated that medical supervision was definitely required and, by June 10, the casualty cleaning posts were receiving such a large number of injured men that all walking wounded and those with minor injuries were forwarded to non-medical LSTs(63) to allow the medics to concentrate their efforts on more serious cases. Although the naval doctors certainly assisted, the R A M C carried out the majority of the work without help.

Treating casualties was particularly difficult on the French mainland as heavy bombing by both Allied and German forces destroyed the majority of the infrastructure in coastal towns and cities, making it difficult for medical troops to find suitable locations to establish sick bays and casualty stations. The task of reconstruction was left to the Royal Navy in designated Port Parties, often including medical officers to work in the makeshift hospitals and clinics. Not well documented in Admiralty records, the information about these Port Parties is based mainly on the reports from the Senior Medical Officer of Port Party No 1500 (64) which was tasked to assist in the reconstruction of Arromanches (65). Each of the two medical officers within the party had a kit bag containing supplies and medical equipment in the event of injury of the other(66) and, after landing, medical stores were carried ashore and a sick bay established as soon as possible (67). Although the majority of the town had been destroyed by heavy bombing, the medical officers were able to find a house in a reasonable condition to equip and use as another sick bay and, on the outskirts, an underground cellar was used as an emergency first-aid post, managed by a junior medical officer (68). The establishment of these sick bays was a key duty as they could then be used to deal with the numerous survivors who were continually landed at Arromanches following the sinking of ships by German underwater mining attacks (69). The treatment of the wounded survivors though was not the responsibility of the Royal Navy medical officers, as their Army counterparts arranged all ambulance transport and accommodation, as well as management of the injured until they were in a stable condition to be returned to the United Kingdom (70). Based on this, it can be suggested that the naval medics were central in the reconstruction of the port and setting up of adequate medical facilities, but cannot be credited with a significant impact on casualty treatment ashore in France.

United Kingdom: Resuscitation and Observation

Across the English Channel, the work carried out in the hospitals once the wounded had been evacuated from the Normandy coast was done mostly by the medical officers of the Royal Navy and was critical in saving as many lives as

possible. The arrangements for tr[illegible] the injured were made by the Principal Medical Officer of the Royal Naval Barracks, who detailed several medical officers to control the disembarkation at the various ports (71). Arrival of casualties into the United Kingdom focused mainly on the ports of Southampton, Portsmouth and Gosport(72) and once a ship came alongside a Boarding Medical Officer checked the number of cases onboard. If the cases were not yet organised according to the severity of their condition they were classified by the Boarding Medical Officer as Port Cases requiring immediate hospital attention or Transit Cases (73). Following disembarkation controlled by senior medical officers (74) the wounded could then be transported to hospitals which were divided into the three categories of Port where the majority of Royal Naval medical officers were based, Transit and Base hospitals (75). Port hospitals could hold 1200 patients, Transit hospitals had a total of 6550 beds and Base hospitals had the most beds for the least injured soldiers (76).

Of the seven designated Port hospitals including Portsmouth, Southampton and Riverstoke (77) Royal Naval Hospital Haslar was the most important in the treatment of evacuated casualties as those that were too seriously injured to be able to stand further removal by train were taken there to be retained and looked after until it for transfer (78). Originally, it was planned that only naval cases were dealt with at R.N.H. Haslar as the Army were able to use other coastal hospitals under the Emergency Medical Services (E.M.S.) scheme. However as the seriously wounded arrived it became clear that the casualties needed to be treated as soon as possible and could not be transported long distances (79). Moribund cases were taken to R.N.H. Haslar and not moved from the hospital at all and certain cases which required careful observation, such as abdominal wounds, were held for up to five days following admission (80). In anticipation of serious injuries, two casualty reception stations had been established which were capable of holding up to 40 cases at a time (81) although only one could be fully manned at all times due to the limited number of medical officers available.

[illegible] These stations proved to be [illegible] valuable in the early stages of the operation when the hospital was at its busiest (83) as from 7 June to 11 June 118 patients required resuscitation (84). A key part of resuscitation was blood transfusion which can be attributed to saving many lives, shown by the figures demonstrating the use of blood products at R.N.H. Haslar in the first fortnight of the campaign from June 7 to June 21: 576 bottles of blood and 438 bottles of reconstituted dried serum were used to treat 150 patients (approximately 25 per cent of the casualties admitted to the hospital) (85). The number of deaths amongst men who were transfused during this only amounted to a total of ten (86).

Away from the casualty receiving stations casualties were treated on the remaining 19 wards (87) holding over 1000 beds (88). Gas gangrene cases and burn victims were significantly fewer than expected, although there were a large number of ophthalmic cases as there was a specialist present within the staff so all cases were directed to Haslar (89). Many traumatic injuries were seen including severe head trauma and chest and thoraco-abdominal wounds (90). Those with injuries to the abdomen often required emergency surgery as abdominal incisions were discouraged in LSTs, although one or two successful operations were carried out when deemed absolutely necessary (91). In order to be able to deal effectively with this number of surgical moderns, the surgical team from the Royal Naval Auxiliary Hospital Barrow Gurney in Bristol was present from 6 June until 16 June (92). These medical officers performed exceptional operations with the result that out of the first 108 patients, of which most were moribund on arrival, only 19 men died (93). It is of great credit to the medical teams responsible for treating these casualties that the fatality rate was so low, reflecting their skill and importance in saving many lives. Overall R.N.H. Haslar accepted 1,347 patients by the end of August 1944 (94) all of whom were dealt with by medical officers who worked tirelessly to ensure that as many men as possible survived

Relative Importance: A Minor Role?

It is evident that medicine played an important part in Operation Overlord and more specifically Operation Neptune. In the first stages of the campaign, from 6 June to 20 June, British casualties totalled 13 672, yet only 1 842 of these died (95). This demonstrates the volume of casualties who were successfully treated by military medical services. Such a high quality of care gave faith to the troops who were reassured that, were they to be injured in battle, there was a high chance of survival. Furthermore, this indicates the importance of medicine to the morale of the fighting forces and therefore to the war effort as a whole (96). However, the role of the Royal Naval medical officers within this effort must be kept in context. Although the Royal Navy were responsible for the majority of the care carried out on LSTs, it must not be forgotten that the Army also worked on board the craft dealing with similar cases in the same environment. The Royal Army Medical Corps also worked alongside the naval medics in Port hospitals, as well as running most of the Transit hospitals, which treated more patients than the Port hospitals although the cases were less severe. Another area in which the Army excelled was the treatment of casualties on the French mainland as the assault advanced, establishing Casualty Clearing Stations and field hospitals (97). The effort can be argued that the Army, having treated more patients, contributed more to the Allied cause than the Royal Navy. This [illegible] Coulter's argument that the part played by the Navy was a relatively minor role in a vast [illegible] operational organisation (98). However, [illegible] Naval medical officers have been shown to have [illegible] in the early stages of the operation, where casualty numbers were at their highest. As a result, I feel that Coulter underestimated the significance of Royal Naval medics in the campaign.

Conclusion

In conclusion, the medical officers of the Royal Navy were involved in key stages of casualty treatment at sea in LSTs, hospital carriers and hospital ships, as well as on larger ships attached to the invading fleet and in hospitals in the United Kingdom. Responsible for the safe evacuation of troops from the assault front and treatment during their journey and upon arrival on British shores, the officers were often under pressure, forced to work for long hours with few resources, yet they were still able to save hundreds of lives. From the research carried out, one could argue that the medical officers on board the LSTs had the most significant task compared to the other naval doctors. This is because they treated the majority of the evacuated casualties and many of the injuries sustained by the troops were severe and traumatic, thus requiring urgent treatment. However, all of the officers involved were responsible for treating casualties and did so effectively. In the end, this was crucial to the morale of the soldiers and therefore the whole war effort, overall. The Royal Naval medical officers were of great importance in Operations Overlord and Neptune in 1944.

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76 I [illegible]

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79 [illegible]
80 National Archives Kew *Operation Overlord* (1944) WO 199/3144
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84 *Medical Report on Operation Overlord July Oct* [illegible]
85 H R E S Blood Transfusion in the Treatment of Shock the Royal Navy In Z Cope (ed) [illegible] *the Second World War Surgery* London 1953) p 14
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87 *Medical Report on Operation Overlord July Oct* [illegible]
88 G [illegible] Blood Transfusion in the Treatment of Shock the Royal Navy
89 *Medical Report on Operation Overlord July Oct* [illegible]
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Service News

Honours, Awards and Citations

Medals

urgeon Lieutenant Com[illegible]
J Mercer Royal Navy
ng Medal

hief Petty Officer Medical Assistant J[illegible]
ssp to Long Service and Good Conduct Medal

Success at ASCAB

Surgeon Lieutenant Comm[illegible]
Royal Navy

COMMISSION TRANSFER

To Medium Commission

urgeon Lieutenant Commander D J Ablett
oyal Navy
urgeon Lieutenant Commander S P Fry
oyal Navy
urgeon Lieutenant Commander D L Potte
oyal Navy
urgeon Lieutenant Commander D S Sargent
oyal Navy
urgeon Lieutenant Commander M Taya
oyal Navy
urgeon Lieutenant R J Boddy Royal Navy
urgeon Lieutenant T G Brogden Royal Navy
urgeon Lieutenant K L Davey Royal Navy
urgeon Lieutenant N L Dodds Royal Navy
urgeon Lieutenant S J Droog Royal Navy
urgeon Lieutenant C J Gibbens Royal Navy
urgeon Lieutenant R J Howes Royal Navy
urgeon Lieutenant F C Lim Royal Navy

Surgeon Lieutenant A S M[illegible]
Royal Navy
Surgeon Lieutenant H S M[illegible]
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Surgeon Lieutenant A P [illegible]
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Surgeon Lieutenant S K R[illegible]
Surgeon Lieutenant L C [illegible]
Surgeon Lieutenant D [illegible]
Surgeon Lieutenant B R [illegible]
Surgeon Lieutenant R J [illegible]

To Full Commission

Surgeon Commander J J Mat[illegible]
Navy
Surgeon Commander R A M[illegible]
Surgeon Lieutenant Commander [illegible]
Royal Navy

PROMOTION

Acting Surgeon Captain to Surgeon Captain

ting Surgeon Captain J G Sharpley
oyal Navy
ting Surgeon Captain L M Thomas
oyal Navy

Acting Surgeon Commander [illegible]
Royal Navy
Acting Surgeon Commander J A J [illegible]
Royal Navy
Acting Surgeon Commander C M [illegible]
Royal Navy

Acting Surgeon Commander to Surgeon Commander

ting Surgeon Commander A Cormack
oyal Navy

Surgeon Lieutenant Commander to Surgeon Commander

Surgeon Lieutenant Commander A Brown
Royal Navy

PROMOTION

Surgeon Lieutenant to Surgeon Lieutenant Commander

Surgeon Lieutenant S Fry Royal Navy
Surgeon Lieutenant L Herbert Royal Navy
Surgeon Lieutenant J Hassett Royal Navy
Surgeon Lieutenant H Evans Royal Navy
Surgeon Lieutenant S Roy Royal Navy
Surgeon Lieutenant C Gibbens Royal Navy
Surgeon Lieutenant A Halpin Royal Navy
Surgeon Lieutenant J Lloyd Royal Navy
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Surgeon Lieutenant O Rainey Royal Navy
Surgeon Lieutenant T Robinson Royal Navy
Surgeon Lieutenant K Davey Royal Navy
Surgeon Lieutenant F Lilt Royal Navy
Surgeon Lieutenant A Proffitt Royal Navy

Acting Surgeon Lieutenant to Surgeon Lieutenant

Acting Surgeon Lieutenant T Anderson Royal Navy
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Acting Surgeon Lieutenant M Hill Royal Navy
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Surgeon Lieutenant T Saunton Royal Navy
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Surgeon Lieutenant J Vassallo Royal Navy
Acting Surgeon Lieutenant M Wilson Royal Navy
Acting Surgeon Lieutenant S Woolley Royal Navy

Surgeon Sub Lieutenant to Acting Surgeon Lieutenant

Surgeon Sub Lieutenant L Baker Royal Navy
Surgeon Sub Lieutenant R Baker Royal Navy
Surgeon Sub Lieutenant P Bennett Royal Navy
Surgeon Sub Lieutenant K Duncan Royal Navy
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Surgeon Sub Lieutenant E Stachow Royal Navy
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Lieutenant to Lieutenant Commander

Lieutenant S Peake Royal Navy

Placed on Retired or Emergency Lists

Surgeon Lieutenant Commander L Herbert Royal Navy

The Commandant's Commendation

Rear Admiral N Morisotti CB Commandant JSCSC) presenting Surgeon Commander F T Marshall with The Commandant's Commendation

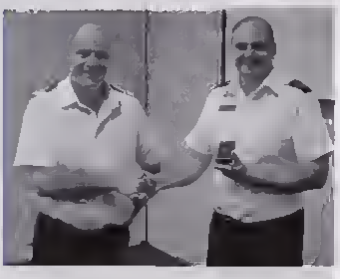
On achieving a Merit in MA Defence Studies) Surgeon Commander F T Marshall was also awarded The Commandant's Commendation "for exceptional contribution to all aspects of life in ACSC

Erroll-Eldridge Prize 2010

The Centenary Erroll Eldridge Prize is awarded jointly to Surgeon Lieutenant Commanders Matt O'Shea and Martin Cutt for their work on evaluating morbidity rates of Valiant Class submarines during Nuclear deterrent patrols over a 13 year period

They are to be congratulated on satisfying the criteria for the fund established in June 1910 under requests from Anna Louisa Russell Waldo-Sibthorp in memory of her husband Commander George Hardy Richard Erroll who lost his life whilst serving his country and William Bates Eldridge The award is for medical officers of the Royal Navy who have made a notable contribution to the improvement of the health of the personnel of the Royal Navy or research thereon

[illegible] Surgeon [illegible]
[illegible] Martin [illegible]



James Lind Seminar and Dinner 2010

J Wickenden

On the afternoon of 21st May 2010 the Institute of Naval Medicine hosted a James Lind Seminar which was attended by over 50 people, both forces and civilian. The guest speakers were:

Dr Hugh Baron (Medical Schools of Mount Sinai, NY & Imperial College London), who spoke on the history of the treatment of scurvy before and immediately after James Lind, including the vexed question of whether he did in fact carry out a clinical trial aboard HMS SALISBURY in May 1747. Although Lind took twelve men sick of the scurvy, there is no indication in the ship's records that more than three or four men were listed sick.

Dr Katherine Foxhall (Centre for the History of Science, Technology and Medicine, University of Manchester), who spoke on the importance of a late [illegible] trials carried out aboard convoy [illegible] 1810 and 1811 at the Institution [illegible] Bulletin. During these years [illegible] acid and citrate of potash (K[illegible]) [illegible] research of [illegible] cheaper and more [illegible] than lemon juice.

Sarah Chalmers, co-[illegible] James Lind Initiative, [illegible] the work of the Office [illegible] mainly the UK Parliament [illegible] about the Eighteenth [illegible] Lind Alliance [illegible] research projects by [illegible] partnership and the James Lind Library (www.jameslindlibrary.org). [illegible] explains and

Guests at the [illegible] James Lind Dinner [illegible] Commodore Flamas.

illustrates [illegible] health care [illegible]

The se[illegible] Lind Dinne[illegible] pork escalop[illegible] ora[illegible] of watercre[illegible] [illegible] part of Lind's tre[illegible] [illegible] were avail[illegible] addi[illegible] scalopate and v[illegible] [illegible] pro roast[illegible] [illegible] thanks on behalf of the [illegible] Rifle[illegible] [illegible] Professo[illegible] [illegible] Wellcome U[illegible]

History of Medicine Oxford Mrs Linda Peters la descendant of James Lind and Mr John Hepner present owner of the original portrait of James Lind by Sir George Chalmers

Thanks are due to the speakers and to MOIC for agreeing to host the seminar also to the President of INM Wardroom Mess for [illegible] the dinner and to Mr John Hepner for his generous gift of a reproduction of the Lind original to INM

Further information on the James Lind Alliance may be found at http://www.lindalliance.org/ and http://www.jamesLindlibrary.org/index.html

[illegible] *Historic Collections Library* [illegible] *Medicine Alive* [illegible] *HistLib@medal*

Future Events

Blood Red Dinner
8 October 2010

Tri Service Occupational Health Symposia
Keogh Barracks December 2010

J Royal Naval Medical Service 2010; 96(2): 123-127

Obituary

Surgeon Vice Admiral Sir John (JAB) Harrison

1921 – 2010

Surgeon Vice Admiral Sir John (JAB) Harrison and I enjoyed a unique privilege as consultant radiologists who both surprised ourselves in reaching flag rank in the Royal Navy. We lived and served a general on apart but had homes in the same Hampshire village and I was able to enjoy an increasing fondness for John as the years passed. I am therefore honoured to write an obituary for a very fine man much of this is borrowed from his son Jeremy in whom I see many of his father's very fine qualities.

Born in Simla on the foothills of the Himalayas to an Engineer rather his early days were comfortable with his personal Siess Namjam who quickly learnt he was to take his orders from four year old JAB (who always had a fondness for his ayahs) and not his father.

Returning to England at the age of six circumstances were quite different. At school his favourite subjects were Geography Botany and Zoology leading him to his lifelong passion for Nature especially trees and rivers then fishing in later life. His love of exploring England also began with cycling holidays in the New Forest wet walking holidays on Dartmoor and a trek up the most Northerly Munro in Scotland Ben Hope when he was thirteen.

The same studies led him to Medicine and entry to Barts Hospital just in time for the outbreak of World War 2. The students were swiftly evacuated to Cambridge where soon he met Jane who had gone to work for Lloyds Bank in Petty Curre after leaving the Perse School. He always said he would never know why she picked him but she did. They were married in Chelsea in 1943 while she was a Wren and he was spending the time not doctoring but Fire watching on the roofs of High Holborn.

From there he went to Winchester County Hospital and treated many wounded returning from the D Day landings. Later on he was then next on the list to join a group of doctors due to help relieve Belsen concentration camp his place was taken by one of his best friends who died shortly thereafter of an infection caught at the camp.

After the end of World War 2 he made his Naval connections more permanent and after a few shore postings was made Medical Officer on HMS SPARROW where the ship's company found it hilarious to have a doctor with the initials JAB. As the Cold War escalated and rarranning was still in operation at home SPARROW departed for two years in the Caribbean where they seem to have developed the early patterns of fic srbsequently known on the Belize Guard Ship. His flimsy air the end of rot reflected the character still of those days and he says he had had completed his Medical duties to the Capitans entire satisfaction and that a whole page praising his role as Mess Social Secretary and wine Steward.

A few years later after he had starred to specialize in Radiology the family moved to Hong Kong during which he gained an enduring respect for the Chinese especially the way the children with no electric light at home would read their schoolbooks under the street lights at night.

From Hong Kong next came an unaccompanied posting to Malta and then a move back to the UK and to RNH Haslar where he was based for the rest of his clinical career building the radiology department there and which he found his most rewarding full-time time. He visited Haslar in later years calling on me and previously Fred Peck in the cross link where we built another radiology

[illegible]

[illegible] during the 1982 [illegible] had a very major [illegible] coordinating the Medical [illegible] to a [illegible] in which there could well have been far greater loss of life than that which did occur in the re-taking of the Falkland Islands. The tributes to the medical staff have been extensive and well deserved, and that tribute must be shared with the man in charge at the time. It was clear that he was not able to enjoy all of his time at 2* and 3* rank, when he was promoted to 2*, he telephoned to congratulate me, hopeful that I would enjoy more of the privilege than did he, indicating that the only time that anyone was interested in medical views in those days was during the Falklands War.

We held a quiet and dignified ceremony for JAB in the ancient Saxon church in Corhampton, close to the banks of the River Meon, reminiscent of his fondness for fishing, and afterwards buried him on a nearby Hampshire hill-side, overlooking the river. I know that he would rather be remembered as a kind, unworldly man, with gentle humanity, to borrow Jeremy's words. We will remember him also as an exceptionally fine Medical Director-General of the Royal Navy. As much as Jeremy and Tim were proud of him as their father, I am proud to have been his friend.

Lionel Jervis

Obituary

Wing Commander Keith Christopher Edsall, MSc MB BS MRCS LRCP, Royal Air Force

1940-2010

[illegible]ith – or 'Biggles' to his [illegible]iends at INM – died on 9 [illegible]arch 2010 after a long and [illegible]istressing illness borne with [illegible]ll of the fortitude and dignity [illegible]hat those who visited him [illegible]esply admired.

He served in the Royal [illegible]avy before studying [illegible]edicine and joining the [illegible]oyal Air Force where he [illegible]specialised in radiation [illegible]edicine becoming the RAF [illegible]nly consultant in this [illegible]specialty as a specialist [illegible]anesi and then consultant [illegible]ith spent many years at INM.

Born on 30 May 1940 in Islington, he [illegible]ever knew his father who was killed at [illegible] Alamein. He was educated at Salvator [illegible]ollege Wealdstone, Middlesex 1948 – 1956 [illegible]here he excelled in sports – cricket, rugby [illegible]mp and javelin. He entered HMS [illegible]ollingwood in 1957 as a JREM and served [illegible]eriously in HM Ships Ariel for HMS [illegible]aedalus, RNAS Gosport/Lee on the Solent, [illegible]oldcrest (RNAS Brawdy with 727 – [illegible]artmouth Cadet Air Training [illegible] NAS), Heron [illegible] (RNAS Yeovilton) and Albion (with 894 Sea [illegible]enom [illegible] NAS), Fulmar (RNAS Lossiemouth), [illegible]spray (RNAS Portland) and Hermes and [illegible]ctorious before purchasing his discharge for [illegible]100 in December 1966 and leaving as a [illegible]VG [illegible]upr [illegible] LREM. He proceeded to St Mary's in [illegible]969 joining the RAF as a Pilot Officer in [illegible]972 and graduated in 1975. Keith worked [illegible]nd studied at the Norfolk and Norwich [illegible]ospital where he met his wife Susan and [illegible]so in Sidcup, Kent.

He married Sue [illegible] 1967. After initial training at RAF [illegible] IHMT Halton he did [illegible] postgraduate course at RAF [illegible] Hospital Ely and then had [illegible] at RAF Hu[illegible] and [illegible] he RN in 1980, [illegible] the Defence Radiation Protection Service (DRPS) at Alverstoke. In 1982 he attended the radiobiology course at Imperial College and gained his MSc in the following year. Subsequently he was to spend [illegible] years in the RAF with DRPS [illegible] shown as "exchange/loan" but [illegible] on [illegible] posting to DRPS from 1988 as Head of the Radiation Medicine and Consultant Adviser in Radiation Medicine to DGNS (RAF) and where he remained except for [illegible] months at CME London during 1991 [illegible] left the RAF in 1994.

[illegible] 1997 he and his family moved to Oak [illegible], Tennessee, where he worked at the Radiation Emergency Assistance Center/Training Site [illegible] of the physicians charged with instructing medical staff and first responders in the event of a radiological event. He lectured all over the USA to hospital and other staff in more than 100 cities. He returned home in 2000 and took up a part time consultancy with Trident Medical Services at the Atomic Weapons Establishment, Aldermaston, where he excelled in training in radiation medicine until 2006.

I knew [illegible] socially for [illegible] the earlier years [illegible] so serious that it was [illegible] this last year that I truly came to know him as I saw him cope quietly in adversity facing his future [illegible] with acceptance and I am faith unwilling the [illegible] to cede victory to frailty until he was [illegible] His intellect remained as sharp as ever and his delightful sense of humour did not desert him.

I believed Keith on his retirement from the RAF and so came to appreciate not only the [illegible] of his endeavours but also the high [illegible] in which he had been held by his [illegible] colleagues. He would undoubtedly have [illegible] further and indeed was offered early [illegible] on to remain perceptively he saw [illegible] writing on the wall and my own [illegible] in DRPS convinced me that he [illegible] right to bale out when he did.

Personally Keith took his duties most [illegible] and he wore his scholarship [illegible] over the practical man. He applied [illegible] and effectively to the challenges that [illegible] his way. He would not hesitate to bless [illegible] very [illegible] senior officers with the benefit of his wisdom when he perceived the need. He could carry this off because of his patently [illegible] commitment to getting it right. He was [illegible] straightforward and sycophancy did not exist in his dictionary.

He was much lauded and in great demand as a lecturer. He believed passionately that it was so vital that young airmen especially should understand the risks associated with aviation and how to avoid or minimise them. Most importantly he ensured that they knew [illegible] and he shall [illegible] would be there for them if [illegible] needed following any incident or [illegible]. He was a truly superb lecturer with [illegible] ability of presenting complex concepts [illegible] simply and he was impressive in projecting his convictions concerning risks [illegible] actions needed with assurance [illegible] further [illegible]. When Keith mounted the dais [illegible] filled the room and he [illegible] the attention of every last one [illegible] audience.

[illegible] was not always serious – far from it he was quite incapable of concealing his most attractive personality and an impressible and sometimes wicked sense of fun beneath his professional mien and he was a leading light in RNM's Wardroom Mess and was life and soul of every social function. He once managed to separate some senior Soviet Officers visiting UK and RNM from their minders. After a Trafalgar Night Mess Dinner, while others left the tables for an intendedly brief comfort break, he diverted the Soviets into the bar and plied them with gin and tobacco resulting in a much extended hiatus before the post dinner events could resume and speeches proceed. Only Keith was capable of listening attentively to the speeches by them. I have never understood, though, how after one Mess Dinner he managed to leave his trousers fly from atop the flagstaff, nor what he wore home – or rather, whose.

It was not widely known that Keith had spent some years in the RN before leaving to study medicine. Nothing delighted Keith more than being twigged by young naval medical officers in the Mess that sea time would, of course, be unknown to him as a "crab-fat" he could respond with relish that he had served in three aircraft carriers and I suspect may have had more sea time under his belt than many in the Mess. Keith was fortunate to travel widely with the RAF and probably saw more of the world than he – or most of us – ever saw in the RN.

Keith could be noticeably well organised. He certainly seemed able to plan and achieve most things to which he aspired and I never ceased to be amazed at how the RAF fell to his entire disposal when it came to flying home large items of garden equipment including, once, a tractor from the USA. When he retired he went to considerable lengths to liberate a Vampire ejector seat from RAF custody, had it mounted on wheels, topped with a lavatory seat and presented it to RNM's Wardroom to accommodate his successors at subsequent Mess Dinners.

Keith is already widely mourned and shall be much missed. Numerous expressions of dismay at his passing have been heard at RNM and much farther afield. All those whose lives

he touched kne[illegible]
horoughly de[illegible]
gentleman he [illegible]
Keith led a f[illegible]
ixty seconds d[illegible]
nuch in his truncated [illegible]
is family he was m[illegible]sely and [illegible]
proud of Sue and of his sons and of [illegible]

Notice has been received of the death of the following:

Surgeon Rear Admiral (D) A E Cadman

Surgeon Captain J M Young Royal Navy

Surgeon Captain D G Dalglish Royal Navy

First Warrantmaster Commander J C McKenzie BEM Royal Navy

Lieutenant M F Stretton Royal Navy

Any words in memory of them are gratefully received

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Otherwise [illegible] spacing or [illegible] should re[illegible]

Title page

The title page should [illegible] informative title [illegible] words, the names and details of all [illegible] and other appointments and the department(s) [illegible] on(s)/ship(s)/establishment(s) where the work was carried out.

Tables and illustrations

Tables and illustrations (figures) should add to the paper rather than only repeating information presented in the text. Each table and illustration should be on an individual page separate from the text, be numbered in two distinct sequences in the order in which they are mentioned in the text and have an explanatory caption (typed on a separate sheet for illustrations).

News photographs of academic social support or other occasions involving members of the Royal Naval Medical Service are welcomed.

Normally, printed illustrations will be monochrome. The views of the Editor should be sought where colour illustrations is thought to be essential or highly desirable. Photographs must be of good quality, glossy, unmounted and be provided in camera ready form, with redundant areas trimmed off. The figure number, author's name and top/bottom should be marked on the back. Line drawings should be professionally drawn and labelled, or of equivalent standard and submitted as photographic prints or high quality photocopies. Lettering and numbering should be sufficiently large to ensure legibility after reduction for publication. Freehand lettering is not acceptable.

Measurements and abbreviations

Measurements should be given in the units in which they were made, but, with the exception of blood pressure in mmHg and haemoglobin concentration in g/dl, non-metric units must be accompanied by metric (SI) equivalents. The approved name of drugs should be used (proprietary names may follow in parentheses). If an abbreviation is used, the term for which it stands should be given in full at its first mention in the text, e.g. Institute of Naval Medicine (INM).

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Responsibility for the accuracy and completeness of references lies with the author(s) and these will not be checked by editorial staff. Only essential references should be included, and authors should verify them against the original documents. References are identified in the text by superscript Arabic numerals, and are numbered and listed consecutively at the end of the manuscript in the order in which they are first cited in the text. A full list of references should be given at the end of the paper using the form of reference adopted by Index Medicus. Papers accepted but not yet published should be included in the references followed by (in press). Those in preparation (including any submitted for publication), personal communications and unpublished observations should be referred to as such in the text only.

Acknowledgements

The assistance of those who are not authors but made substantial contributions to the study and/or preparation of the paper should be acknowledged as should the source(s) of grant support, equipment, drugs, facilities etc.

JOURNAL
of the
ROYAL NAVAL MEDICAL SERVICE

Vol 96 3 2010

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Contents

Editorial

At the time of writing the dust is still settling from SDSR [illegible] for force structure [illegible] somewhat clearer. From the [illegible] Ert [illegible] There remains a true of goodwill towards us from very senior [illegible] Afghanistan and in perspection the we may have been [illegible] be protective of delivery organisations but we may ve [illegible] headquarter structures 2011 is likely to be very challenging [illegible] Op HERRICK 14.

Afghanistan tends to now pervade much of what we do. A substantial [illegible] Institutes work is dedicated towards Land operations and we have a stea[illegible] our staff from all departments and seconded doctors undertaking deployments [illegible] fully aware that the medal awards we feature are only the tip of the iceberg [illegible] saddler note we are now seeing several of those severely disabled through [illegible] coming through to attend the Medical Boards or Survey at the end of the r[illegible] We lost one of our own this summer in Sapper Will Blanchard whose non TA [illegible] a DSTL Health Physics based here.

The Journal however remains relatively buoyant and I now have a steady stea[illegible] varied articles as reflected in this publication. It will look to developing the journ[illegible] next year and revitalising the management committee to include more internal [illegible] successful track records in publishing/academia. Volunteers would be welcome [illegible] I actively go out and seek suitable stable nominees.
In the longer term we may seek to develop an impact factor but to do that we [illegible] need to broaden our subscription base.

Apologies are due for the delay in meeting publication dates this year but the time [illegible] to collate, check and proof read together with our printers processes can be [illegible] substantial although we are getting more offers of help. We will aim to do better [illegible] year.

David Brown

J R Roy Nav Med Service 2010 96 3 136-138

Clinical

Royal Marine Arctic Warfare Training: Early Field reduction of clinically diagnosed anterior shoulder dislocation

A Keenan, A M Wood, C Arthur, J J Bakker Dyos

Introduction

Royal Marines train annually in the Arctic. This involves training Royal Marines how to survive, operate and skill in this hostile environment. Shoulder injuries account for 4 to 11% of alpine skiing injuries and shoulder dislocation is common (1). Whilst most recreational skiing done in and around piste areas with easy access to the local hospital and a dedicated medical service, training within the Royal Marines relies on the integral vehicle assets within a Commando group and the field medical team, which consists of a Unit Medical Officer and medical assistants.

Medical equipment is limited to an emergency crash bag and simple analgesia, although this may be supplemented with oral or auto injectors.

This presents a unique challenge to the medical team when combined with the inherent access and evacuation routes when skiing off piste areas. We report a series of three early detected dislocated shoulders, reduced in the field and suggest an effective technique.

The first patient is a 21 year-old Royal Marine with no previous history of shoulder dislocation. He fell whilst night skiing in the [illegible] training carrying a Bergen. A [illegible] 2006 snow vehicle was brought to his [illegible] medical officer skied to meet [illegible] at a previously agreed rendezvous point. The patient was in obvious discomfort [illegible] but managed over snow so the [illegible] was able to reduce the shoulder in [illegible] the patient was given IM Morphine [illegible] sedated using a modified Hippocratic method and a dramatic improvement in the patients pain. The patient was taken to the local hospital and X rays demonstrated no bony lesion and the patient was returned to the UK for rehabilitation at the local MDHU.

The second patient was a 28 year old Royal Marine who slipped on ice skiing and dislocated shoulder whilst travelling over a mountain below the snow line. The patient was planned into cover and it was decided to evacuate him, however no assets were available at the time and the patient was required to move across difficult terrain to an evacuation point. A decision was made to reduce the shoulder to assist with movement of the patient. In order to facilitate the movement of the patient, splints were avoided and the shoulder was reduced using simple analgesia and an inter-capsular injection of lidocaine. The shoulder was reduced using a modified Hippocratic method and the patient was able to walk off the mountain to the road head. Check X rays confirmed no fracture and the patient was evacuated to the UK for further treatment.

The third patient is a 24-year-old Royal Marine Reservist with a previous history of a dislocated shoulder, who presented to the medical officer after a fall wearing skis on ligher order whilst preparing for a night ski. On examination his shoulder was found to be squared and movement in the arm was limited due to pain. Neurovascularity was intact. He was taken to the snow vehicle (BV 206) where simple analgesia and a triangular bandage was applied. The decision was made

to reduce the sho [illegible] time to get to [illegible] result or d f [illegible] route The par ant was [illegible] Morphine and the shoulde [illegible] a mod fied Hippocratic method [illegible] BV The patient was immo [illegible] comfortable and evacuated [illegible] hospital where check x ray [illegible] reduced shoulder with a bony Bi [illegible] The Royal Marine was sent home on the Aeromed service for local follow up and stabilization

None of these patients suffered any neurovascular or significant bony injuries as a result of in field reduction All patients were reduced within half an hour of their original injury and comfortable throughout the reduction procedure

Discussion

Military personnel have been demonstrated to be at high risk for dislocation of the shoulder this is associated with junior rank and young age (2) and especially involves those aircrews involved in high upper limb loading activity such as carrying a heavy Bergen (2)

Dislocated shoulders will be seen frequently when novices are learning to ski in Norway They will also be seen in camp due to the icy surfaces

Injuries on exercise will frequently be in remote areas with significant logistical challenges to comfortably evacuating the patient Whilst shoulder x-rays should be sought prior to reduction where possible we suggest that where such facilities are not available that field reduction will facilitate safe and comfortable evacuation of the casualty

All of our cases were relatively low energy falls in a young fit population and had a history and examination consistent with a simple anterior dislocation In high energy dislocations or where a fracture dislocation is suspected field reduction is not recommendad

In young athletic people it has been argued that if no neurologic contraindications or signs of fracture are seen radiographs are unnecessary and early reduction before the onset of muscle spasm is essential (3)

[illegible] tant s [illegible] needs [illegible] a tha [illegible] located [illegible] feel [illegible] ty [illegible] or [illegible]

Conclusion

Where military [illegible] a dislocated shoulder [illegible] should consider early [illegible] facilitate comfortable eve [illegible] facility Performing reduction [illegible] presents a unique challenge [illegible] team A reduction technique [illegible] with a small enclosed space [illegible]

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J Royal Naval Medical Service 2010 96 3 139-145

Clinical

A clinical reflection: why does deliberate self-harm pose such a challenge for doctors?

RH Coetzee

Introduction

Deliberate self harm (DSH) now represents a significant burden to health services[1]. For instance, in their eight-week study of presentations to 31 Accidents and Emergencies Departments in England, Gunnell et al(2) found 4033 presentations with deliberate self harm, of which 10% were admitted psychiatrically. Clearly therefore, doctors require training in managing individuals who harm themselves. However, what is sometimes overlooked in training is the emotional aspect of dealing with these individuals: these individuals present in very acute situations, which can represent an unpleasant emotional experience for doctors and accordingly some doctors may feel reluctant about working with these individuals. This article reflects on some of the factors that may contribute to this state of affairs, and offers some potential solutions.

Why do people self harm?

Common reasons for DSH are reported in Box 1(3). DSH can occur in individuals who have

1. To communicate distress ("cry for help")
2. To influence events and decisions by means of others (communication with others)
3. As a coping strategy for stress management ("time out") and unbearable physical symptoms
4. To commit suicide

Box 1. Common motivating factors for deliberate self harm

limited emotional communication skills and who lacked the opportunity to develop adaptive coping skills, such as talking through the emotional experience and accessing support networks. In some cases certain mental illness, for instance depression, can also erode an individuals coping skills to such an extent that they resort to DSH, which they would probably not contemplate under normal circumstances. These individuals may frequently find themselves in situations where they are confronted with intense emotional experiences due to life events, but lack the skills to resolve them at that point in time. Therefore, DSH can be understood as a method of communicating distress and a attempt to seek help. Doctors often find self harming behaviour difficult to comprehend from their own functional point of view, and it may be dismissed as attention seeking.

DSH frequently occurs after a contextual recent life event, that the individual is desperate to alter, for instance the breakdown of a significant relationship(3). These events can frequently leave the individual with a soluble problem, coupled with emotional desperation to avoid the feared outcome, for instance losing the partner permanently. Therefore, DSH may become the only perceived means of influencing the situation to avoid the feared outcome, although it is not necessarily conscious decision. The difficulty arises when including doctors, may perceive the DSH as being manipulative and would react to such a way. Most doctors are probably Psychiatry will be familiar with individuals who states that they will harm if they certain outcomes are not secured, many of these individuals may also experience

dysfunctional and [illegible] inter-personal relationships and they [illegible] earned over the years that threats are [illegible] DSH can alter the decisions made by others and therefore avoid negative outcomes for the individual. A typical example would be the reconciliation of a relationship in the wake of an overdose. Hence with time DSH acts as a distress signal may no longer [illegible] conscious decision but may become an automatic conditioned behaviour.

DSH can also become a feature of behaviour [illegible] dealing with the day to day management of [illegible] relationships. This is commonly described [illegible] individuals who cut than selves as they find [illegible] and even scoring blood as an [illegible] release [illegible] the [illegible] In the wake of this behaviour they [illegible] emotional tension and are [illegible] areas [illegible] However it can [illegible] highly addictive behaviour leading to [illegible] DSH that may be [illegible] However [illegible] may be a passing [illegible] adolescence and early [illegible] emotional [illegible] individuals regardless of [illegible] are at an [illegible] pulled suicide [illegible] may [illegible] looks at the [illegible] associated with the [illegible] so maybe may wish [illegible] taking an [illegible] behaviour [illegible] indicates an motivation [illegible] well trained to [illegible] high suicidal intent [illegible] violent means [illegible] tions against [illegible] DSH as [illegible] important as [illegible] DSH as [illegible] intervention [illegible] to the [illegible] risk [illegible]

The [illegible] Self [illegible] UK Armed Forces and [illegible] Fortunately the overall risk [illegible] this is lower in all three services [illegible] when compared [illegible] except [illegible] years of age where there were 1.5 times more deaths than expected(4). In a recent article by Hawton et al(5) some unique insights were gained into DSH in the UK Armed Forces. In the Armed Forces personnel DSH was often a response to relationship and employment problems complicated by alcohol misuse. It is also noteworthy that they were less likely than the civilian control group to have a current or past psychiatric disorder, past treatment for a mental health problem and tended to have lower suicidal intent and rates of previous self harm.

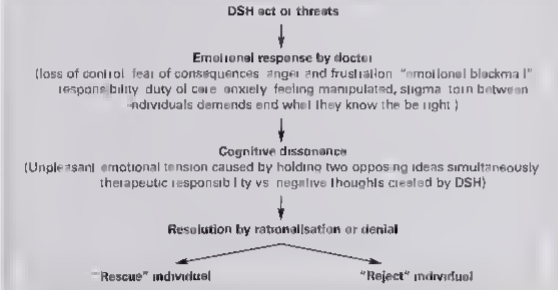
The doctor's experience

Qualitative research by Hadfield et al(6) found in a small sample of Accident and Emergency doctors there were three main themes in their approach to those who have self harmed. These were: treating the body, silencing the self and a tendency to mirror cultural and social responses to self harm. This means that the doctors had a tendency to focus on the physiological aspects of treatment at the expense of the emotional distress. In silencing the self, doctors were reluctant to discuss the personal feelings the DSH evoked in them such as the challenges it poses to their motivations as doctors (to cure) and fears of insanity if they explore their personal feelings. Even when one grasps the motivation behind DSH as above, it is difficult to manage the negative feelings one may have towards the individual. This might be augmented in a military environment where personal strength, self-sufficiency and group cohesion is so highly prized. It may be that doctors come into these situations holding ideas that those who self harm are weak, immature, seek to avoid their responsibilities or have a personality disorder. The natural drive may well be to dismiss the self harm and seek an outcome that conforms to the doctor's views of what is rational and desirable within a reference frame of good coping skills and military bearing. This is not to imply that the doctor does not have the interests of the individual at heart, as sometimes this drive is fuelled by valid principles of not providing undue feedback or reward to the behaviour. However, the acutely distressed individual may not be able to see or

acknowledge this point of view as they are lost in their emotional experience.

This may leave the doctor with a difficult emotional experience themselves. Take the individual who has inflicted a minor cut to his wrist, and is threatening further DSH if he is sent on a 6 month deployment with his ship in two days. Regardless of the motives and situation of the individual, the doctor may experience the act as blatantly manipulative and as malingering. When this presentation is with a physical problem, like a knee problem, doctors may feel more equipped to be robust and return the individual to their ship, but it may not be so simple in those who have self-harmed. The drive to act robustly is opposed by the fears that the individual may in fact resort to further DSH, or even successfully complete suicide. The Executive may also take a dim view on the deployment of an individual who subsequently engages in DSH and disrupts the functioning of the ship, which may lead to difficulties for the doctor subsequently. Therefore, although the doctor may clinically and emotionally experience a strong drive to return the individual, they are pulled equally powerfully in the opposite direction. This dichotomy gives rise to potent cognitive dissonance, which is the emotional tension that is created when an individual is torn between two opposing ideas that each conveys some advantages and disadvantages. Often, the more profound the differences between the opposing poles, the more negative the emotional experience.

This cognitive dissonance may be the key to understanding the possible behaviours that doctors may engage in under these circumstances. The manipulation that the doctor feels may well amount to emotional blackmail, and may provoke a desire to resist and retaliate. However, this course of action may have great future cost, thus leading to the doctor experiencing an intense loss of control. In other words, in spite of their desire to the contrary, they are forced into considering capitulation to the individual's wishes. This state of cognitive dissonance is unpleasant and is unlikely to be maintained by an individual. The natural drive is towards seeking resolution and returning to a state of emotional equilibrium. Therefore doctors may commonly resort to either rationalization or denial to resolve the dissonance, which in turn leads to two unhelpful behaviours: rejection and rescuing. This cascade is detailed in Box 2.



Box 2. Doctor's emotional cascade that leads to unhelpful rejecting or rescuing responses in DSH.

Rejection and rescuing

Denial may be the principle coping strategy that underlies the process of rejection. The doctor experiences the dissonance as described above. In return, the doctor neutralises the discomfort by denying certain emotional aspects internally and with the individual, and this may extend to denying certain clinical facts or granting them less importance. This allows the doctor to adopt the position where the rejection and distress of the individual and consequences of the action becomes acceptable, thereby resolving the conflict internally. It may also have the purpose of granting a secondarily conscious reward to the doctor where the individual feels to be punished for creating the conundrum in the first place, and thus to behaviour that causes the doctor inconvenience. The process of rescuing creates such an ill behaviour and to the negative treatment of those [illegible] e.g. substance misuse, [illegible] incompliance or insufficient psychotherapy assessment, and even open hostility and [illegible]. The NICE guideline(7) on managing [illegible] very emphasises the need to resist a [illegible] response, which explains the [illegible] key piece on compassionate and [illegible] (see Box 3). Although rejection may [illegible] emotional dilemma, it may do so at [illegible] cost to the doctor. If there is an [illegible] outcome subsequently, the doctor may find themselves in an indefensible position. In addition, the doctor may have failed to live up to the core expectations of their profession, which is to provide good medical care and which may be of fundamental importance to many doctors on a personal level.

The process of rescuing is underpinned by rational set of principles, although denial can also play a part (as indeed can rationalisation in [illegible]). Essentially the doctor finds logical and plausible reasons to do something which they intuitively know not to be right. In essence, the emotional turmoil of having firm boundaries and taking therapeutic risks which are required in managing those who self harm is negated by simply providing the desired feedback to the DSH. For instance, by giving undue attention and by readily complying with requests that allows the individual to escape the situation without any need to develop functional coping skills. This approach offers an immediate reward to the self harming behaviour and therefore encourages its future use by the individual, both consciously or subconsciously. Examples of rescuing behaviour may include reflexive downgrading injudicious use of sick leave, undue intervention with the Executive, removal of responsibilities and medicalisation of social issues. The danger of rescuing is that it is more likely to contribute to further DSH and the risk of completed suicide in the long term.

- Always treat people with care and respect
- Ensure privacy for the service user
- Take full account of the distress associated with self harm
- Offer the choice of male or female staff for assessment and treatment. If it is not possible to give people a choice, explain why and write it in their notes
- Always ask the service user to explain in their own words why they have self harmed. Remember, when people self harm often, the reason for each act may be different on each occasion, don't assume it is done for the same reasons
- Involve the service user in clinical decision making and provide information about treatment options

Box 3. General principles for the assessment and treatment of DSH (National Institute for Clinical Excellence)

The solution: Management

In cases of DSH, two people are engaging in an interaction where both parties may bring their own emotional and often unacknowledged expectations to the situation. As the doctor it is important that you are aware of your own emotional state and how this may drive you to either rescue or reject the individual. This "self check" is the first step and allows you to remain objective and reduce the emotional impact of the event. The aim is to achieve resolution through a considered Care Plan. It is also important to accept that the individual is going to be emotional and that they feel desperate to avoid certain outcomes. Therefore, there may in some cases be limited room for negotiation and compromise as the individual cannot see beyond the immediate emotional threat.

A practical suggestion is to move the DSH to one side and assess the presenting problem or situation as if they did not use this method to highlight their plight. In other words, try and understand what is distressing them and why. Once this has been achieved, consider what course of action would have been reasonable without the DSH presentation before factoring in the DSH. In other words, if the allocation of sick leave, downgrading or Executive intervention would have been appropriate without the presentation with DSH, it is likely to still be reasonable with the DSH presentation. The doctor should not allow their own emotional state to bar them from doing what would have been reasonable. However, in this argument one must consider the individual who repeatedly harms themselves, in which case what would have been reasonable for a one off episode of self harm may not be so now. Those with one-off or widely spaced episodes of self harm generally present as a different clinical group with long periods of functionality in between episodes. With them the management of the current risk should be given more weight, but with those who repeatedly harm themselves it may be best to favour the management of future risks, by taking therapeutic risks in the present. In the former, short term diffusion of risks and alleviation of responsibility may be very therapeutic and lead to recovery and long periods of stability, but in the latter group it may encourage future DSH and make the individual dependent on the system.

In considering duty of care, it is important to realise that people are first and foremost responsible for themselves. Unless an individual is so mentally ill that they have lost capacity, they are responsible for keeping themselves from harm and for not engaging in behaviour that puts them at risk. In addition, no one has the ability to predict future events with 100% certainty, and no matter how good the Care Plan is there may still be an adverse outcome that was not foreseen or preventable. Therefore, it is only imperative that the Care Plan was reasonable, well documented and represents what most doctors at that time would have done. Thus, if the doctor does take the risk of not responding to DSH-related demands, and there is an adverse outcome, that they will be protected if they made reasonable, calm and therapeutically based risk management decisions. Doctors cannot do so if they go into a consultation in an emotional state, leading to poor decisions due to their subjective state. Psychiatrists as a group often have a number of patients out in the Community whom they realise may commit suicide, but they are taking this therapeutic risk based on a clearly documented and reasoned risk management plan. As with any other specialty, they accept that in some cases they might go wrong. A useful analogy occasionally is that a patient with chest pain with two normal ECGs taken two hours apart and normal cardiac enzymes may collapse in the car park with a heart attack immediately after discharge. A reasonable Care Plan did not change the outcome, but is defensible.

The best management plan is likely to be one where there are elements of rescuing and rejecting, as this represents a compromise. Care Plan based on an objective assessment. Often this means accepting that you cannot win, for instance when you cannot send an individual who still states a continued intent to harm themselves back to a ship that deploys in 2 days. On other occasions a brief intervention may allow you to

1. Start with an emotional "self check" and acknowledge emotional aspect of the assessment. Take time to compose your thoughts and plan your assessment
2. Move the DSH aside as an issue and assess as if the individual chose a more functional means of presentation. What would be a reasonable Care Plan then? Now factor in the DSH
3. The key is to be willing to compromise within reason and to have a reasoned and acceptable Care Plan. It is not about one party "winning" or "losing"
4. Try not to "reject" or "rescue" the individual
5. Sometimes therapeutic risks need to be taken, especially in those who repeatedly self harm. People are responsible for themselves and sometimes even a reasonable plan can go wrong
6. Clear, thorough, legible and contemporaneous notes are essential, especially in your risk assessment.
7. Communicate clearly and share risk information as needed
8. Consult a colleague, even at the same level as you, as that shows that another reasonable clinician agreed with this plan. If available, a more senior colleague or Mental Health Professional is a good first port of call

Box 4. Suggestions for dealing with DSH

send the individual back and it is important to understand that there is no standard solution. What works in one situation may be wholly inappropriate in another. If the doctor realises that it is not about "winning" or "losing" but compromise, then the emotional burden is lessened as there is no personal prestige or emotional need linked to the outcome. This, fact along with the realisation that people are responsible for themselves, can lead to a marked improvement in the negative emotional experience of managing those who have self harmed, thereby allowing the doctor to be therapeutic and to take well reasoned risks when needed. Some suggestions for managing those who self harm are summarised in Box 4.

Conclusions

Dealing with individuals who harm themselves may frequently present doctors with a markedly negative emotional experience. Failure to recognise these emotional responses may lead to them dictating unhelpful responses where the individuals are rescued from the situation or rejected when they are in need of help. By recognising this emotional response, doctors are able to remain objective in their assessment and formulate a Care Plan based on reasonable compromise or, where necessary, on taking calculated therapeutic risks. On occasions this may involve some "rescuing" from their situation and in others a Care Plan that may therapeutically challenge the DSH behaviour. The key is to remain calm, be thorough and document clearly, whilst acknowledging that you are dealing with individuals in distress who lack the emotional language and coping skills needed to engage with you, other than by harming themselves.

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Acknowledgements

The author would like to thank Dr Matthew Gould, Clinical Psychologist, and Colonel Robin Simpson, Joint Defence Professor of General Practice, for their perusal and input on drafts of this paper.

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J Royal Naval Medical Service 2010; 96(3): 146-149

Clinical

Management of the trauma patient: what happens after the patient leaves Afghanistan - a 40 Commando Royal Marines perspective

J T Evans, A M Wood, I M Wood

Introduction

From April to October 2010 40 Commando Royal Marines deployed to Afghanistan on OP HERRICK 12. During this period they experienced some of the most bloody engagements experienced by British Forces in Afghanistan to date. As a result of this over [illegible] patients were evacuated through the medical chain. In this article we aim to illustrate what happens to the trauma patient after the in theatre treatment and evacuation.

Manpower resources

In order to facilitate the onward treatment of patients, 40 Commando was augmented by an extra General Duties Medical Officer to provide service support to the base sickbay and an extra Practice Manager (POMA). The base command structure was also augmented by a WO1 RM Casualty Tracking Officer who worked closely with the medical chain and a WO2 RM who acted as the Officer Commanding Rehabilitation Troop (Terrorist Tpt).

On top of these augmentees, the rear party had a Civilian Medical Practitioner (CMP), a Leading Medical Assistant, a Royal Navy Medical Assistant, a part time Civilian Administration Assistant (CAA), a Physiotherapist and Exercise Rehabilitation Instructor (ERI).

The other significant players in ensuring the smooth flow of information were the Royal Marines Liaison Officers attached to Queen Elizabeth Hospital, the RCDM Rehabilitation Officer, the Corp Casualty Officer and service Medical Officers at RCDM.

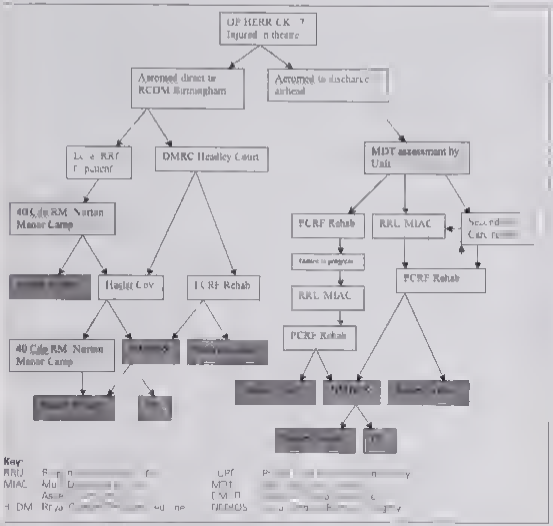
Patient Pathway

The flow of patients from theatre back to 40 Cdo RM is complex and best denoted with the use of the following flagram. The eventual aim in all cases is to return a patient to the highest functional and operational standards possible. Although [illegible] is limited in some of the more complex patients the same pathways should be followed.

It is important for the patient not to be treated as something to be passed between organisations. The central role of 40 Cdo RM in this patient pathway and adequate communication at all levels in the process helped to avoid the patient feeling like he was being pushed around and losing his sense of belonging.

RCDM Pathway

Before the patient's arrival at Birmingham preparations are made from the NOTICAS signals to estimate required specialities, theatre time and urgency required to treat casualties. Upon the arrival of the patient a clinical assessment is made by the on call trauma and orthopaedic team, augmented by the Military Registrars, the Military Burns and Plastic Nurses, and any particular specialities required to manage each individual patient. The patients are then triaged for theatre and operated on in due course, sometimes with surgical teams of up to 20, concurrently operating and sometimes for multiple episodes. Once the initial operative treatment is finished, preparations are made for the patient to be discharged.



Common Pathway: Injured to Rehabilitation

40 Commando's practice was for the Unit Medical Officer to communicate closely with the Military Rehabilitation and the Rehabilitation Co-ordinator. Officer on bended knees attendance at the military ward round on a Tuesday morning will ensure appropriate. This allowed a greater understanding and flow of information between a physiotherapist and rehabilitation team and the unit rear party. It also allowed for the discussion of clinically difficult cases post discharge and ensured that patient care was optimised.

This novel approach to ensuring good communication between primary and secondary care, in normalised patient confusion and distress, [illegible] care by [illegible] the patient [illegible] Officer [illegible] turf [illegible] management [illegible] patient [illegible] and [illegible] recognised that [illegible] patient [illegible] Unit Medical Officer [illegible] about the [illegible] each patient.

A knock on effect of this [illegible] that accurate records [illegible] back briefed to the [illegible] Medical Officer and team about the [illegible] patients that had previously [illegible] facilities.

Discharge Airhead

A significant number of pa[illegible] the aeromed cat evacuat[illegible] discharged from the aeromed [illegible] airhead. They then became [illegible] for the Unit to adequately manag[illegible] administratively and clinically.

The Unit would be informed of the imminent return of a patient via signal and it was then the responsibility of the Casualty Tracking Officer (WO1 RM) to ensure the safe passage of the patient back to 40 Cdo RM Norton Manor Camp. After landing in the UK the patient was collected from the airhead and brought directly to Norton Manor Camp.

The Unit Medical Officer (Rear Party) and Medical Centre team were informed of the patient's arrival date and time at the earliest juncture by the Casualty Tracking Officer. Immediately on arrival at Norton Manor Camp the patient was taken to the Medical Centre where the Unit MO, CMP ERI and physiotherapist would see him in a multidisciplinary team clinic. This enabled a full assessment of the patients clinical and well being needs to be made as well as giving the patient the early opportunity to be introduced to the physiotherapists in his rehabilitation. At the initial meeting it was ensured that the patient was downgraded to an appropriate JMES category, they were given adequate sick leave and all contact details updated.

On completion in the Medical Centre the patient was returned to the Base Coy HQ where he was transferred into the Rehabilitation (Termoli) Troop (on paper) and introduced to the OC and Tp C/Sgt. The patient was then seen by a member of the TRM team who made an assessment of the patient and entered him into their system. Someone from the Unit Personnel Office met every patient on return as well to ensure all paperwork was completed as early as possible.

This patient was typically sent away for a period of 2 weeks Sick On Shore before reporting back to 40 Cdo RM. During this period the patient attended any clinic appointments (hospital OPD or MTAC) and continued with initial physiotherapy exercises given at the initial MDT Meeting.

The Unit Rear Party medical team including Unit MO, CMP MA, OC Termoli Tp and the Unit Casualty Tracking Officer met in a minuted weekly meeting to discuss all elements of the care of the returning patients. This included a review of the location of all injured personnel, individual progress in rehabilitation, general administration and future plans for each patient. It was identified at this meeting which patients needed medical review and slots were booked for them the following day. This close interaction with the Chain of Command ensured that patients attended all medical appointments internal and external to 40 Cdo RM, and that the limitations of each individual were very clear.

As patients improved they were upgraded. This meant that the patient was able to either return to theatre, enter into the Battle Casualty Replacement pool or be returned to other employment on Camp under the auspices of Base Coy.

The Unit Medical Officer (Rear Party) also communicated frequently with Haslar Coy in Devonport, ensuring that if patients needed to be transferred either to or from Haslar Coy it was done efficiently and with a full medical hand over.

External organisations were also invited to hold outlying clinics at 40 Cdo RM, both NMOH Devonport and DCMH Plymouth, held regular clinics at 40 Cdo RM. This maximised efficiency of effort as often there were many patients travelling from 40 Cdo RM to Plymouth, all for one clinic. It also allowed MDT input to clinics, a service not available by just writing an PMed7.

Conclusion

The augmentation of 40 Commando with extra medical and support staff allowed a close working relationship to be formed with the surgical and rehabilitation teams at RCDM. It also allowed the Unit Medical Officer to attend the military ward round and therefore increase his understanding of the injuries sustained. We would recommend

that in future 3 Commando Brigade operations Royal Naval surgical representation at RCDM combined with the augmentation of Rear Party medical teams should be strived for wherever possible to optimise the flow of information and maximise patient care.

The use of a Unit Casualty Tracking Officer ensured the flow of patients and information pertaining to them moved smoothly when external organisations such as DMRC Headley Court and RCDM were involved. This as well as the important role of the OC Termoli Tp also goes to show how the MDT has evolved to include many people and services who never thought themselves to be part of the Medical Centre organisation and the effective management of these people and services is integral in ensuring the effective management of returning trauma patients.

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10 Commando Royal Marines Rear Party Medical Officer

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J Royal Naval Medical Service 2010 96 3 150 163

Clinical

Managing the risk of heat illness on board Type 23 frigates deploying to the Arabian Gulf

T Stevenson, D Roiz de Sa

Abstract

Temperature extremes are commonplace in the Middle East varying between 30°C and 50°C. During the summer months temperatures reach 50°C consistently with high humidity and sea temperatures rarely dropping below 33°C (1). Sailing from the temperate climate of the UK. Ships crews are deploying to these extremes and working in spaces within the Ship where temperatures can reach as high as 52°C for at least 4 out of 6 months. Type 23 frigates (T23) were designed to anti submarine warfare (2) (anecdotally assumed to be North Sea based) yet now deploy continuously to hotter climates which subjects personnel to increased heat stress putting them at risk of heat injury. These risks can be minimised with simple measures such as acclimatising hydration rest periods outside of hot workspaces and finally cooling techniques such as inserting the arms up to the elbows in cool water for 10 minutes. During the 4 months spent in the Arabian Gulf on a 6 month tour during the summer of 2010 personnel on board the T23 frigate HMS SOMERSET suffered no cases of heat illness despite the risks due to employing these simple strategies.

Introduction

Heat illness is an all inclusive term which encompasses several conditions including those of heat exhaustion and heatstroke (3). The effects of heat on health and wellbeing appear in some of the earliest written documents of mankind as far back as Homer's Iliad (c. 1100 BC) and its significant effects on various military endeavours have regularly been reported in history (4). An interesting example can be found following the Six Day War of 1967. The Egyptian Army at the time were issued minimal supplies of water compared to the Israeli Army where soldiers were issued 1L water per hour per person (5). Egypt suffered approximately 20 000 casualties, the majority of which were attributed to heat illness whereas Israel suffered no reported cases of heat illness (6). For a population indigenous to a hot climate to suffer such appalling rates of heat illness suggests that management of the risks of heat illness is paramount to operational success within a population of British service personnel deploying to climatic extremes. In its most mild form the effects of heat stress and strain can result in symptoms ranging from dizziness headaches a reduced capacity for physical work reduced cognitive and psychomotor performance (7) and increased risks within the workplace environment (9). In its most severe form it can lead to collapse coma multiple organ failure and death. Reducing the risks of heat stress and prevent on of heat illness in an operational unit involves identifying risks and managing them accordingly. This paper will discuss the contributing factors of heat stress that personnel on operational warships can expect to find themselves exposed to during deployments to the Middle East such as OPTELIC or CALASH and the methods used to minimise the risks of heat illness occurring in those personnel. The examples used will be from HMS SOMERSET a Type 23 frigate deployed to the Gulf on OP TELIC in summer 2010.

Environment of the Gulf

Ships can expect a rise in temperature once they have passed out of the Mediterranean Sea through the Suez Canal. Transit through

the Bab el Mandeb Strait (BAM) into the Gulf of Aden (GOA) brings ships to the main area of operations for CALASH deployments and counter piracy patrols. Moving north east to the Gulf of Oman (GOO) then North West to transit through the Strait of Hormuz (SOH) brings ships to the Arabian Gulf where CALASH deployments extend across the Southern Arabian Gulf (SAG) and Central Arabian Gulf (CAG) and TELIC deployments take place in the Northern Arabian Gulf (NAG). Ships deploying to either tasking can expect a 6 month tour of which at least 4 months will be spent in the regions described above encompassing either summer or winter. Whilst winter in the Gulf is more bearable with temperatures averaging 20ºC this paper will examine exposure during the summer months where ambient temperatures can climb to 50ºC in the NAG (1) and approximately 40ºC in the SAG along with high levels of humidity. Furthermore sea surface temperatures of around 32-34ºC can increase the strain on ships machinery to breaking point whilst deployed in these Gulf zones.

Type 23 Frigates

The Type 23 frigate (T23) was designed to fight in anti submarine warfare during the throes of the Cold War which [illegible] first class of [illegible] appearing in 198[illegible]. It was thus designed to be conducting patrols mainly in the [illegible] Atlantic and North European waters [illegible] its roles now are far more versatile. The [illegible] of the T23 appears to presage a second [illegible] in more tropical climates. The ship has an onboard Chilled Water System (CWS) responsible for cooling the equipment and machinery to allow them to remain operational. There are three CWS plants onboard [illegible] which are designed to work in a maximum seawater temperature of 30ºC (3). [illegible] tropical conditions, defined as a sea water temperature of >33ºC, the CWS [illegible] well and may result in machinery and equipment failures in addition to raising the background temperature of the habitable [illegible]. Whilst in the Gulf HMS SOMERSET experienced an average daily seawater temperature of 34-35ºC. This lead to not only an increased background heat of the living spaces but extreme heat in the spectrum as shown in Table 1. Furthermore a lot of weapons engineering (WE) equipment [illegible] internal sensors which alarm when they exceed the recommended working temperature of 30ºC as occurred throughout the majority of the tour.

Location (inc. Location Marker)	Maximum Ambient Air Temperature (recorded)
Main machinery spaces (CW Plant Room 4E, Fwd AMR 4F, GTR 4G, MGR 4H, UAMR 1H, AvCat Pump Space 4K, Tiller Flat 3N)	50-58ºC
Hangar 1K	50ºC
Galley 2F	
3J (Ship's Office, overflowing space, offices)	38ºC
Winch Well (onboard gym) 2M	48ºC
Laundry 2L	
Buffer's Shack 2M P	45ºC
Cipher deck 2N	40ºC
Upper Deck / Seaboats	44ºC

Table 1. Examples of hot spaces within a Type 23 frigate (1).

These are just a few examples of hot spaces within the ship where the above readings were not occasional but consistently measured on a day to day basis particularly during the months of July and August. The strain placed on the CWS resulted in several failures of the system leading to a catastrophic rise in onboard temperatures, the subsequent failure of numerous electrical and weapon systems, and the near incapacitation of the entire ships company due to extreme heat, saved only by the actions of the Marine Engineering (ME) department. Amazingly no members of the Ships Company developed heat illness probably due to the mitigation employed.

By comparison the CWS onboard a Type 23 frigate (T23) manages better in these extreme conditions. This is due to the fact that the larger ship, the T23 operates with five CWS plants compared to the three onboard a T22 and thus is able to further compensate for high seawater temperatures.

Exposure

The Ships Company onboard a T23 are exposed to thermal stress under two main categories: the environment and that produced by physical work or exercise or a combination of both. Environmental conditions exert influence on the effectiveness of the body's thermal cooling systems. Conditions such as high environmental temperatures and high humidity, particularly in combination with physical activity and military clothing are known to increase the risks of thermal stress and exertion associated heat stroke (12). ME department personnel spend a large amount of a watch in the main machinery spaces, particularly during routine maintenance and machinery breakdowns. Crew and aircrew engineers laboured for hours in the Lynx helicopter or in the hangar, both of which had continuously high temperatures day and night. Chefs and other galley staff spent the duration of their watches in the galley area without respite from the temperatures they were exposed to. Upper deck maintainers spent large amounts of time not only exposed to high ambient heat, but also exposed to additional solar radiation necessitating a further requirement for protection from UV radiation. Finally the upper deck gun crews, seaman specialists and boarding teams, including Royal Marines whose activities include boarding operations, seaboat transfers and providing force protection at sea or alongside, were exposed to heat and sun for prolonged durations, all whilst wearing body armour, lifejackets and combat dress with headgear and weapons both during exercises and live operations.

Physical training is widely encouraged to maintain fitness, but is also actively pursued by many to release the pressure of working long stretches of defence watches whilst deployed in theatre. Personnel take part either in organised exercise such as upper deck circuit training or personal training such as running around the upper deck or exercising in the gym which is situated in the winch well. This area remained at a constantly high temperature during the day falling only to around 40°C during the night (whilst in theatre in the summer months).

Risk of Heat Illness

The risk of heat illness comes mainly from exposure as outlined above, however there are several other contributing factors which can be predicted (3):

- Poor hydration
- Tiredness
- Alcohol (or heavy indulgence the night before)
- Poor acclimatisation on or new into theatre
- Workload
- Poor nutrition
- Obesity
- Poor Aerobic Fitness (13)

Individuals with a high aerobic fitness will both acclimatise faster than those who are less fit and have a higher capacity for physical work. This advantage confers almost no improvement when combining protective clothing and working in heat (14), necessitating strategies to reduce risk.

Risk identification provides one of the most important tasks for the onboard medical team who should provide regular health briefs to the Ships Company. It is important that everyone

Heat Exhaustion (Signs & Symptoms)	Heat Stroke (Signs & Symptoms)
Core temp <40oC	Same as for heat exhaustion plus CNS disturbance
Tiredness / weakness	Core temp usually >40oC
Dizziness	Confusion
Headache	Irritability
Palpitations	Fainting
Nausea & vomiting	Coma
Sweating	Tachycardia
Cramps	Hypotension
Prostration	Rising core temperature

Table 2 Signs & Symptoms of Heat Illness adapted from Greaves I, Porter K, Oxford Handbook of Pre Hospital Care (1st Edition) 2009 (15)

from junior rating to Commanding Officer is aware of both the risks and the signs and symptoms of heat illness. Heat illness is divided into two broader categories: heat exhaustion and heat stroke. Heat exhaustion by definition is where a patient's core temperature (rectal) is less than 40°C with symptoms as seen in the table below, usually following exposure to heat over long periods or following short periods of overexertion (15). Heat stroke is a more severe condition with a combination of central nervous system (CNS) impairment usually with core temperature (rectal) recorded at greater than 40°C and symptoms as outlined again in Table 2.

Medical Officers are advised to brief Ships Company thoroughly on the above in order to foster recognition of heat illness. This increases vigilance towards problems developing, allows easily identification of significant thermal strain in personnel where those affected may not not on appearance of symptoms and helps prevent the onset of illness or injury. Further first aid advice and medical management guidelines can be found in JSP 539 (3) and in the published educational guides for climatic injury (16).

Cooling

Guidance for risk assessment and safe duration of activities at various temperatures can be found in JSP 539 (3), however these only account for temperature readings from Wet Bulb Globe Thermometer (WBGT) gauge up to a WBGT index of 32°C. Ambient air temperatures were monitored regularly across the ship with dry bulb mercury thermometers as opposed to WBGT. Although the WBGT measurement is more accurate as an indicator of thermal stress (because it also takes into account the effects of radiant heat, humidity and air velocity), it was not a readily available method onboard. Furthermore, due to the nature of their work, many of the Ships Company found themselves spending hours at a time in their respective work areas, and were unable to spend time in a cool environment following such exposure as most, if not all compartments were subject to similarly hot ambient temperatures.

Preventative strategies (17,18) can be adapted for those working onboard the T23 who are exposed to heat extremes where regular breaks for cooling may not be feasible towards the nature of the job at hand, e.g. aircrew engineers working on the Lynx helicopter. Advice sought from the Institute of Naval Medicine lead to the following cooling methods being employed onboard HMS SOMERSET (19):

- Roll sleeves up, immerse both arms up to the elbows in a bucket of cool water (~15oC) for 10-15 minutes every hour or as close to this as is realistically

- [illegible]
- [illegible]

[illegible] with water or electrolyte drink) and [illegible] onward referral if appropriate [illegible] reporting to INM Environmental Medicine [illegible] takes place (3) via forms as at annex A.

Conclusion – Minimising Risk of Heat Illness on a T23

With the risks of heat illness onboard a T23 now identifiable, the next step is to reduce the risk in a way which is practical to maintain throughout the deployment. After guidance from INM (19), the medical team from HMS SOMERSET advised the following simple steps to ensure risks were not only minimised but also flagged up should they arise.

- Remain well hydrated (drinking approx 1L/hr of WATER whilst in a hot space).
- Add a pinch of extra salt to food to ensure body salinity is maintained and to avoid dilutional hyponatraemia (21).
- If time permits, leave workspace, strip off overalls and use fan and water spray for cooling.
- If time does not permit, immerse bare arms to the elbows in a bucket of cool water for 10-15 minutes to allow increased sustainability for work.
- Observe urine (cloudy, yellow and infrequent suggests poor hydration).
- Observe each other – buddy-buddy vigilance practiced with Ships Company looking out for each other, particularly whilst exercising in the winch well, or [illegible] y spaces [illegible] the Ship [illegible] with [illegible] le.

[illegible] n [illegible] v [illegible] lived [illegible] for [illegible] ra d reu [illegible] has had a [illegible] at effec [illegible] at satron [illegible] onment (23). In much the same [illegible] nboard ships with efficient air [illegible] ny Ind t harder to acclimatise or [illegible] e prone to suffering with heat [illegible] whereas those onboard a T23 will be [illegible] n higher background temperature [illegible] ther deployment. This is perhaps [illegible] ositive point of the discomforts felt in many of the habitable spaces.

Suggested further work that should be undertaken in this area includes ships deploying to hot climates sourcing WBGT monitors which are available as a NATO Stock Numbered item. These should be placed in the areas described above and regular recordings made to compile a list of WBGT index ranges throughout the deployment. This would allow accurate exposure times of the crew to be calculated and should exposure times be exceeded regularly, prompt change required to lower the risk to the health of the ships company.

It is clear from the points explored in this paper that the risk of heat injury is significant with the T23 ships deploying to the Gulf. Minimising this risk is the key part in prevent on of heat illness and this falls primarily under the responsibility of the Medical Department. Education of personnel is invaluable as it encourages propagation of the measures put in place as discussed above. Following a series of heat illness and health briefs onboard HMS SOMERSET leaflets were placed in each of the mess decks as at Annex B and Ships Company were encouraged to bring questions about heat illness to the sickbay at any opportunity. Following all these measures, HMS SOMERSET came through the OPTELIC summer 2010 tour with no cases of heat illness, despite the arduous conditions experienced by those serving onboard.

Annex A – Heat Illness reporting form as per JSP 539

Reference (if applicable)			
Ship/Unit/Station		**Sub Unit**	

CASUALTY DETAILS

Personal Number		Name		Initials	
Rank/ Rate		Regt/Corps/ Trade		DOB	

INCIDENT DETAILS

Date of Incident		*Time (Local)*	
Location			
Activity			
Clothing Worn			
Equipment and Weight Carried			
WBGT Index Reading			

CLINICAL DETAILS

Casualty Temp		Where was temp taken?	Rectal Axilla Oral TM*	Time temp was taken	H
Signs and Symptoms	Pulse B P				
Diagnosis					
Other Clinical Measurements	BM O Sats				
Subsequent Action (Cooling IVI and so on.)					
Disposal (for example Admit MRS / Hosp and so on.)					

PREDISPOSING FACTORS

Unacclimatised	Yes No NA*	Unfit	Yes No NA*	
Alcohol	Yes / No NA*	Sleep Deprivation	Yes No NA*	
Dehydrating Illness	Yes No NA*	Respiratory Infection or febrile illness	Yes No NA*	
Failure to Replace Fluid Loss	Yes No NA*	Medication Drugs	Yes No NA*	
Previous Heat Illness	Yes No NA*	Obesity (State BMI if a contributory factor)	Yes No NA* BMI	
Other Relevant Factors for example, equipment				

*Delete those not applicable (NA Not Applicable) Continue on reverse if more space required.

Name of Medical Officer Signature Date

Annex B – Heat Stress Prevention Leaflet for Ship's Coy on HMS SOMERSET

Heat Stress Prevention

During this deployment many ship's company will undergo prolonged exposure to temperatures ranging between 30 and 55 degrees centigrade

This carries with it a risk of developing heat illness so what can you do about it to minimise that risk?

Average working times on land would be 45 minutes on 15 minutes off in a cool environment to allow body temperature cooling

Obviously that cannot always be achieved in the working environment onboard a ship so here are a few tips to help you if you are exposed to high temperatures on a daily basis

- → Aim to drink 1L water per hour you can measure if you are well hydrated by the frequency and colour of your urine going regularly and paler & clearer in colour is better
- → Add a pinch of salt to your meals this helps keep your body sodium levels normal and prevents dilution from all that water you are drinking
- → For every tour of work in a hot part of the ship take 10 minutes to roll your sleeves up and place your arms up to the elbows in a bucket of cool water (approx 15 degrees doesn't need to be ice cold!) and gently stir them around 10 minutes can help lower your core body temperature (and you don't even need to take your overall off!)

Remember that stress can cause serious problems Simple measures can stop those problems from developing!

Any queries or concerns contact the Sickbay

Medical Officer

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Annexes

A Heat [illegible] Injuries [illegible] Table [illegible]

B Heat [illegible] Hints [illegible]

Surg Lt Tom Stevenson PN MC [illegible]

Dr Dan Roiz de Sa CMO Eng [illegible]

J Royal Naval Medical Serv ce 2010 96 3 158-164

General

Surgery in an Afghan population: is pictorial consent and injury pattern recognition identification of patients appropriate?

A S Matheson, R D Howes, M J Midwinter, A W Lambert

Structured Abstract

Surgery in an Afghan population: is pictorial consent and injury pattern recognition identification of patients appropriate?

Objective The aim of this study was to develop a safe way to obtain informed consent and ensure the correct patient was operated on in a generally poorly educated non English speaking Afghan patient population admitted to a military role 2 (enhanced) hospital facility

Summary Background Data Prior to Herrick 9 surgical consent for Afghan patients was obtained via an interpreter in the traditional manner and documented on a UK formatted consent form (MOD form 660) (group 1) with patient identification largely being the responsibility of the interpreter. Patient agreement was documented by placing a thumbprint on the form. During Herrick 9 pictorial consent and injury pattern recognition (IPR) identification of patients was introduced. The consent was written as part of the case note narrative with diagrammatic representation of the injuries and the proposed surgery which was explained by the interpreter (Group 2)

Methods We compared the consent and identification process for ten consecutive patients from each group. Each method of consent was examined for documentary evidence of the procedure, patient identification and method of patient agreement. The senior Afghan interpreter was asked for his personal views on the benefit or otherwise of the pictorial consent.

Results For group 1 each of the nine MOD form 660s were completed in English by the operating surgeon and included details of the procedure. Seven had been signed by the interpreter. Each had a thumbprint on the form but there was no name or date alongside it. There was no way of confirming that the thumbprint was that of a particular patient.

For group 2 pictorial consent was documented in the narrative with specific documentation of the injury pattern of that patient. Confirmation of consent and patient identification by IPR was by the operating surgeon

Conclusions When possible informed consent is required for all patients undergoing surgery in line with Department of Health guidelines. The use of pictorial consent and IPR identification as part of patient documentation would appear to be superior in this particular environment

Aim

The Department of Health has published guidelines detailing the requirements for valid surgical consent. The aim of this study was to develop a safe way to obtain informed consent and ensure the correct patient was operated on in a generally poorly educated non English speaking Afghan patient population admitted to a military role 2 (enhanced) hospital facility

Introduction

It is the right of the patient [illegible] may or may not be done to [illegible] health professional is obtained [illegible] prior to commencing any treatment [illegible] being an integral part of good [illegible] in England case law has established [illegible] treating a patient without [illegible] may constitute the offence of [illegible]

On deployment valid consent [illegible] prior to treatment under the Clinical [illegible] for Operations 4 03 1 (CGOs)(2). Working in a Role 2(E) medical facility in Afghanistan requires obtaining valid consent from a generally poorly educated non English speaking Afghan patient population. The primary aim of this study was to compare the traditional method of obtaining consent with an alternative devised with this patient population in mind.

The second purpose of this study was to compare standard measures for patient identification with Injury Pattern Recognition (IPR) of patients for the same Afghan patient population. Patient identification and identification of the correct surgical site is the first check of the WHO Surgical Safety Checklist and recognised worldwide as the responsibility of the surgical team (3).

Background

To fulfil the requirements for valid consent the patient must have the capacity to consent, give the consent voluntarily and be appropriately informed on the procedure.

The Mental Capacity Act of 2005 states that a person lacks capacity if they have an impairment or disturbance in the functioning of their mind or brain (4). The assessment of capacity is based on the ability to make a specific decision at the time it needs to be made (1). A person is unable to make a decision if they are unable to comprehend the information relevant to the decision, retain the relevant information, weigh up the information as part of the decision making process or communicate their decision (4).

Comprehension of information. In non English speaking patients the ability to comprehend the information is of vital importance. CGOs [illegible] patient [illegible] fail (2) [illegible] [illegible] fakul [illegible] use- [illegible] [illegible] to [illegible] is the use [illegible] this is classed [illegible] service (5). The gold standard is the use of a qualified professional interpreter with experience in the medical field. It is this level that is used in the Role 2(E) medical facility. The quality of interpretation can be split into two parts (5). The first is the fidelity – how accurately the message is rendered, specifically the avoidance of omissions, additions, substitutions and editorialisation. The second is the transparency of the interpretation – the degree to which the language used could be that of a native speaker (5).

Communication aids are a valuable asset. Visual aids such as pictures and diagrams can clearly and rapidly convey a large volume of information and their use is common in parts of the medical profession such as paediatrics. The advantage of visual aids, such as pictures, is that they do not rely on a third party and therefore risk omission of data. The most common problem encountered when using interpretation services (6).

Information required. For the patient to give valid consent they must have received sufficient information about the treatment or procedure. The amount of information needed is based on case law, with the courts the final arbiter of what constitutes responsible practice. It must be enough to understand the nature, the purpose and the risks of the procedure, as well as the implications of not having the procedure. In Pearce v United Bristol Healthcare the judgement concluded that it was the duty of the doctor to inform the patient of a significant risk which would affect the judgement of a reasonable patient (1). In Chester v Afshar a majority of the House of Lords held that a neurosurgeon that did not inform a patient of a small risk was liable to that patient when the risk materialised

Following [illegible] healthcare [illegible] also [illegible] [illegible] [illegible] doctors [illegible] [illegible] personally need to make the decision [illegible]

Weighing up the information Different patient populations encountered have cultural differences and differing views of healthcare and operative procedures. For the consent to be valid they must understand and be able to weigh up the information. For this to be possible the proposed treatment must make sense to the patient in terms of their key view of ill health and their cultural perspective on ill health and its treatment. With the use of a level 1 interpreter the translation will be culturally specific allowing for the patients view of ill health and understanding of the medical intervention (6)

Documenting of Consent The consent obtained from the patient must be documented in the patient case note narrative. Traditionally this is done on a consent form however consent is acceptable if expressed verbally and documented in the notes. The provision of a consent form does not prove the validity of consent. The form merely provides evidence that consent has been taken and is good practice in interventions such as surgery. The form is not valid if any of the criteria for consent have not been met.

If consent forms are used Department of Health guidelines advise that if a patient is illiterate they may make their mark on the form to indicate consent although the guidelines add that it would be good practice for this to be witnessed by someone other than the clinician obtaining the consent and that it should be documented in the notes that the patient has chosen to make their mark in this way (1). At the Role 2 (E) medical facility in Afghanistan the patients traditionally mark the consent form with their thumbprint witnessed by one of the hospital interpreters. A problem with the use of consent forms with Afghan patients in a British military medical facility is the reluctance to sign or mark an official looking paper. The other option is asking patients to their thumbprint in the front page of the Royal Military Police during the investigation of detainees undergoing treatment.

Prior to Herrick 9 consent was obtained via an interpreter and documented on the MOD form 660 using the patients thumbprint. The general surgeon for Herrick 9a introduced pictorial consent via an interpreter with injury pattern recognition using the completed diagram as evidence in the case note narrative of informed consent. The pictorial consent used a hand drawn picture/diagram of the proposed procedure as a visual aid whilst the consent discussion via the interpreter included all the traditional areas of procedure/risks/benefits.

Tackling the problems encountered in obtaining valid consent in our patient population is the responsibility of the clinician providing the treatment or intervention. Obtaining the consent may be done directly by the clinician concerned or GMC guidelines allow for the task to be delegated to another health professional as long as that person is suitably trained and qualified has sufficient knowledge of the proposed intervention or treatment understands the risks involved and has agreed to act in accordance with the guidance laid out in Consent patients and doctors making decisions together (7)

Patient Identification and Injury Pattern Recognition Injury pattern recognition (IPR) was introduced to assist in the confirmation of patient identity at the peri-operative stage. The first check of the WHO Surgical Safety Checklist is that the patient has confirmed the identity procedure site and consent (3). Sedlen and Barach in their study of wrong side/wrong site wrong procedure and wrong patient adverse events on the American Society of Anesthesiologists Closed Claims Project Database found wrong patient events made up 10% of the claims/cases (9). The Florida Code 15 Mandatory Reporting System adverse event data had wrong patient adverse events consistently making up 12

15% of cases between 1990 [illegible]
A review of ophthalmic surgery [illegible] Simon found that the surgeon [illegible] end surgical resident were [illegible] error in 90% of the wrong patient [illegible]

There are several known [illegible] wrong site/wrong patient surgery [illegible] include having several surgeons involved in the same operation, multiple procedures during one operation, time pressure, emergency surgery and abnormal patient anatomy (11). All of these will be encountered by a forward surgical team in Afghanistan. Bartlett et al found that patient with communication problems are 3 times more likely to be subjected to an adverse event (12). Obviously this places our focus population, non English speaking Afghans undergoing emergency surgery, often with multiple wounds requiring multiple surgeons working simultaneously, at very high risk of a surgical adverse event.

To prevent wrong patient adverse events in the NHS, patients are required to have a wristband identifier that fulfils the National Patient Safety Agency (NPSA) design requirements. The wristband must contain the patient's last name, first name, date of birth, and NHS number (or temporary number until NHS number known) (13). This presents obvious problems in a patient population with variable spellings of surnames given by the patient and their family, the common use of false names, and unknown date of births. There is a heavy reliance on the patient number as their identifier.

In the NHS modern technology is being used to prevent adverse events. Innovations include the use of bar codes on a patient's wrist band. Active Radio Frequency Identification – a WiFi tagging system, and the use of biometric identifiers (14). However none of these is currently feasible in role 2(E) facility in Afghanistan.

Injury pattern recognition consisted of the operating surgeon documenting the patient's injuries with the consent picture. Prior to commencing the case, the theatre staff and surgical team would use this as well as the patient's hospital number and name to confirm the correct patient.

Method

[illegible] of patients was [illegible] written as part of [illegible] ungrammatical phrases [illegible] and the proposed [illegible] explained by the interpreter.

We compared the [illegible] identification process [illegible] patients from each group. The documentation was [illegible]

- Documentary evidence [illegible] the procedure
- The details of the [illegible] obtaining the consent
- Method of patient [illegible]
- Method of documenting [illegible] agreement
- Use and documentation [illegible] services

The senior Afghan interpreter [illegible] his personal views of the [illegible] of the pictorial consent.

Results

Nine patients from group 1 and seven from group 2 had consent taken via an interpreter. The others had been intubated prior to arrival in the facility.

For group 1, each of the nine MOD form 660 were completed in English by the operating surgeon and included details of the procedure. Seven had been signed by the interpreter. Each had a thumbprint on the form but there was no name or date against it. There was no way of confirming that the thumbprint was that of a particular patient.

For all seven patients in group 2, pictorial consent was documented in the [illegible] with specific documentation of the injury pattern [illegible] that patient. All seven had the signature of the

[illegible]

Discussion

The difficulties of obtaining consent in an emergency setting from a population with whom there is a language or culture are obvious. This paper is to develop a safe way of informed consent and to ensure the patient is operated on.

Although group 1 used the going [illegible] for the consent of UK patients this [illegible] the consent documentation showed [illegible] in the patient identification of Afghan [illegible] using this traditional method. Although the patient's thumbprints were documented the [illegible] no date or name along side the print and [illegible] method of identifying thumbprints combined with the lack of identifier for the interpreter, this difficult to prove whether the [illegible] patient had been properly identified and [illegible] for surgery.

However, as the group 2 consent forms [illegible] the only patient details along side the [illegible] details, it is easy to relate the document to the patient and feel confident in the patient's identification and that they had received a full and valid consent.

Our method for examining the consent has been a review of the case notes. The obvious drawback of this method is that it does not allow us to examine the consent discussion only the documentation that has been filled. We can only use this as evidence of what the discussion may have covered.

There are several issues with this patient population as to whether the patients felt that they had sufficient information and whether this was communicated to them in a manner they could understand. That the senior Afghan interpreter of the hospital felt that the understanding of patients who underwent [illegible] consent was superior gives a strong indication that it is superior with regards the [illegible] and comprehension of the [illegible] given.

In June 2008 the WHO launched the second [illegible] Global Patient Safety Challenges, Safe Surgery Saves Lives. By using a checklist to be completed for every operation and involving all members of the surgical team, the initiative [illegible] to improve anaesthetic safety practices, [illegible] the correct site surgery, reduce surgical site infections and improve team communication. Currently Chief Executives across the United Kingdom are to ensure that the checklist is completed for every patient undergoing a surgical procedure in their trust.

The effectiveness of the checklist was demonstrated by Haynes et al of the Safe Surgery Saves Lives Study Group, following data collection on patients from eight hospitals in eight cities across the world (15). Using the primary end point of rate of complications during hospitalisation within the first 30 days following the procedure, they showed a reduction in complications from 11% to 7% following the introduction of the checklist with the death rate falling from 1.5% to 0.8%. The case mix including rates of urgent cases had no effect on the significance of the outcomes.

The surgery performed in a role 2(E) facility [illegible] very high risk of wrong patient or wrong site events due to the multiple risk factors involved. These include having several surgeons involved in the same operation, multiple procedures during one operation, time pressure, emergency surgery and abnormal patient anatomy. Our focus population are at further risk due to the difficulties in communication and identification. The Surgical Safety Checklist had not been introduced when our study was carried out and its introduction would have highlighted the problems with patient identification, ticking the very first box on the checklist within the role 2(E) hospital would be a challenge. Patients who may be unwilling or unable to confirm their identity or who have several spellings of their name require a further check to ensure the correct patient is being

operated upon. This study [illegible] would be a suitable additional [illegible].

There were no wrong patient [illegible] events in any of the cases [illegible] study. This may well be due in [illegible] study group sizes than the safety procedures in place, however, IPR clearly provided another safety net against such an events. A larger study will have to be undertaken to prove its effectiveness and investigate how it would fit in with the Surgical Safety Checklist.

Conclusion

When possible, informed consent is required for all patients undergoing surgery in line with Department of Health guidelines. The use of pictorial consent and IPR identification as part of patient documentation would appear to be superior to traditional methods of consent and patient identification in this particular environment.

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General

The medical implications of changes to Officer training

A Dew, C Wake

Introduction

On 27 April 2009 Britannia Royal Naval College (BRNC) adopted a 3 Term Entry system replacing the previous 6 entries per year. In addition the structure of Initial Officer Training (IOT) was changed combining Initial and Common Fleet time and absorbing the Fleet Board in to the syllabus. Officers passing out of Dartmouth are commissioned from their day of graduation and move directly to phase 2 specialist training. The IOT syllabus emphasises physical fitness, sight and Command, Leadership and Management (CLM); the physical component has implications for medical standards and injury rates, whilst a one shot system makes good pre-medical screening before and immediately after entry essential.

The changes to Initial Officer Training

RNTM 27/09 outlined the new structure of IOT. A core 28 week program for all Naval College and Direct Graduate Entries was developed based on two 14 week terms with 5 key pillars: Maritime, Military, Staff, CLM and Moral Component of Operational Capability (MCoIOC). Included within the programme is a 10 week combined Initial Sea Training (IST) and Common Fleet Time package (CFT). Initial Fleet Time (IFT) IFT was designed to bring together the elements of IST and CFT, reduce the churn at the start and end of those packages and reduce the burden at sea requirement.

The emphasis on the term one is maritime saturation, basic seamanship and leadership and contains the majority of the physical demands on cadets. Maritime saturation starts during the first two weeks of training but continues throughout both terms. Seamanship is delivered throughout but especially in a sea week and during Basic Sea Survival Course (BSSC) and CODEX. Leadership is taught and examined during weeks 5 and 7 exercises BLD and ABLE, the first of these three day exercise contained within the college whilst the second uses the challenging conditions on Dartmoor to stretch and test the cadets for four days whilst living in the field. Figure 1 contains the term 1 programme.

Division	1	2	3	4	5	6	7	8	9	10	11	12	13	1
C1a	Induction		Sea + River	SS ESD W	BLD	518 + OIC	ABLE	Nav PB	[illegible]	COD EX	W WO OP	SS ES S DW	Nav ME	P
C1b														t
C1c			518 + OIC	Sea + River		SS ESD W		W IW O OP	Nav PB	[illegible]	COD EX	Nav ME	SS ES S DW	
V1a														
V1b			SS ESD W	518 + OIC		Sea + River								
V1c														

Fig 1. Course structure for Term 1 of Initial Officer Training. BLD, ABLE and CODEX represent the leadership exercises. CODEX has since been renamed AILE (Assessed Improvised Leadership Exercise).

Fig 2 Course [illegible] Office training, BLD, ABLE and CODEX deployed [illegible] leadership exercise [illegible] CODEX [illegible] been renamed AILE (Assessed Leadership Exercise)

The first ten weeks of term two are delivered at sea during FT. Divisional relations by the nature of their [illegible] dedicated only on capital ships. Modules [illegible] on safety and final assessments are [illegible] the departments at sea [illegible] on CLM and staff program throughout. The final assessment comprises a written end of Fleet Board. The final 4 weeks of term 2 lead up to pass out and include a rigorous final exercise – MARL which assesses leadership in a sea environment using their river assets at BRNC. Figure 2 contains the term 2 programme. Term 2 does not cause significant number of injuries as training is not increased from term one and is not discussed further.

In addition to IOT, military set on courses for Med Cal/ Dental Officers and OARNNS (Short Introductory Course). Chaplains and RFA are run. SIC runs in the second 7 weeks of term leading up to pass out and has its own Induction, Staff, Seamanship, CLM and Pass Out phases. This autumn will see the second SIC course pass out under the new structure and the author believes the use of a bespoke package better delivers what future MOs and DOs require and passing out with the rest of the colleagues is invaluable.

Cadet Profile

RN Officer Cadets are drawn from all backgrounds. There is capacity for 360 RN cadets per year with an additional 75 cadets from foreign navies (International Cadets). 80% were graduates, 11% were female and 7% were upper yardsmen. Each entry comprises up to 144 cadets split into two squadrons and six divisions of 24.

Physical training and Grit

The previous 2SLs guidance for Military people Better Leaders, More Grit has led to an approach in Officer Training where determination in the face of diversity and against physical difficulties is encouraged. This is admirable but can result in cadets soldiering on with injuries or feeling pressured to continue despite them. The emphasis of physical training during IOT has increased and higher physical standards expected of those who do not arrive at the right point on the training curve are predisposed to injury.

Medical Problems

The programme in the first ten weeks very quickly and cadets start physical training early and are expected to reach a high sreed and [illegible] exercise ABLE in week 7. Exercise BLD in week 5 often leads to minor injuries and there is very little time to recover before ABLE, addition ABLE failures (medical or CLM) are retested in weeks 10 or 11 for multiple complete BSSC immediately before. There is therefore very little time to recover from injuries. In addition the heavy programme of PT leaves little spare time for medical or rehabilitation appointments and [illegible] challenging for the cadets to find time to attend or complete remedial training.

The graph in Figure 3 shows the injury rate during term 1 of IOT and is from statistics taken during the first entry of the current structure. There are peaks corresponding to the increase of physical training or induction end from injuries associated with exercises BLD and ABLE weeks 5 and 7 and a smaller peak in weeks 11/12 from the refined arrival exercise.

Strategies to reduce injury rates

Pre joining fitness Cadets are strongly encouraged to arrive at BRNC fit and injury free. The BRNF [illegible] ow ru[illegible] umnality Interview Board [illegible] d cadet [illegible] a pre joining fitness program and [illegible] e allows a

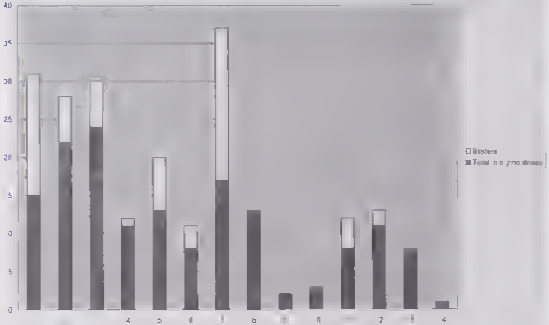

Fig 3 The graph sh[illegible] y [illegible]ate p[illegible] [illegible] e[illegible] [illegible]ent[illegible] or [illegible]us. B st[illegible] can be up to 50% [illegible] h case [illegible] bad

Figure 4 shows the types of injury
The majority of injuries are lower limb with knee and shin pain predominant

set of combat [illegible] RNFT [illegible] in the first two weeks [illegible] predisposition injury during [illegible] ambition to withdraw cadets from training [illegible] they do not pass an RNFT on joining but at present they must achieve the standard before pass out.

Rescrutiny The larger and less frequent entries has created an opportunity to review all cadets' medical standards on entry. Pre joining medicals are now conducted by medical examiners contracted by CNR and there is variation in the standard of medical. Face to face rescrutiny of the cadet and his Fmed 1 (conducted at HMS Raleigh) prevents those with known medical problems starting training and identifies those with new injuries. Those cadets who are not fit to continue are withdrawn from training early (1 or 2 per term).

Feedback loops After the first run of the current structure it was possible to identify those weeks where injuries occurred and often which physical sessions were worst. By feeding this information back in to the system injury rates in the second term were reduced particularly in the first half of term.

The PMO attends a weekly meeting with the [illegible] training and used live injury data to influence and change training policy and [illegible] injury rates in the first three weeks of term. Injury rates were reduced by 50% although this effect was reduced later in the term because the leadership exercises are relatively inflexible. See Fig 5.

Blister prevention Preventing blister formation reduces the rate of lower limb injuries. Strategies to reduce blisters include breaking in boots before joining and education on self treatment; the merits of different sock and tape combinations are debatable but the subject of a current audit at BRNC. During all encounters with cadets for routine medical work the importance of blister prevention and self treatment is emphasised and this has reduced the presentation of blisters at fresh cases; the effect of this on injury rates and actual blister frequency is not known.

Preventing back terming

IOT was designed as a one shot system with cadets passing through on their first attempt.

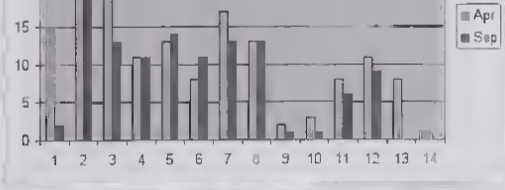

Figure 5. Comparison of April and September entry. April is on the left. Injury rates were reduced compared to the previous term by providing back data on injury rates to the training teams and responding to injury data to identify where in training injury occurred.

no second chance was anticipated and if recruiting is buoyant back terming is difficult. Reducing injury rates is the most important strategy to reduce medical back terming but once injured cadets must be actively managed to optimise their chance of completing training first time. Although the programme is fixed the training teams are flexible and seek to change training where possible to adapt to cadets needs. Flexibility is also required of the medical teams to provide intense treatments and occasionally to allow cadets to participate in exercises when not 100% fit. This can raise medical dilemmas as the cadets inevitably want to train on despite their injuries but also has a responsibility to supervise the exercises adequately and recognise when training an exercise is not in the cadets best interests.

While it is not possible to create more time the program it has been possible to increase the amount of time available to the cadets for rehab by withdrawing them from physical training periods. This relies on a dedicated Rehabilitation Instructor taking classes at 0600 three times per week and during additional sessions during the day. Wednesday afternoon sports sees all the rehab group training together (classes vary from 3 to 25). The aim of rehab is recover the patient from injury and return them to training at the same level as the rest of their division and so involves strenuous if sometimes alternative exercise.

Despite all efforts some cadets need time to recover from the training. Medical back term numbers are between 3 and 5 cadets per term. The earlier a cadet is back termed the more time is available for recovery and rehab and so the pressure is to make the decision early. Fractures and significant knee and ankle injuries make up the majority of backtermers and most only do one extra term.

Since IOT09 was introduced one cadet has been referred to Medical Board if Surgery for injury.

Medical Standards

The application of the medical standards in JSP 346 and BR 1750a let recruiting prevents many unsuitable candidates starting training. The physical demands of the course are high and candidates must be P2 Fit for Arduous Duties. The demands are not always recognised by Upper Yardsmen (UY) some of whom arrive unprepared. The guidance in BR 1750a is woolly and an amendment is proposed but assessing doctors should ensure cadets are P2 and fit before joining BRNC. UY who are P3 or below should not ordinarily join and attention must be paid to visual standards. Once promoted UY who cannot complete training are likely to be discharged medically as they cannot be returned to their source branch.

Conclusion

The introduction of IOT 09 means that medical standards must be applied rigorously to Officer Candidates. Injury rates are predictable from the structure of training but whilst there is little time to recover several strategies mean that back terming in unusual

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Principal Medical Officer at BRNC. Charlotte Wake is a GDMO and worked at BRNC as part of her [illegible] Acknowledgement is given to Surgeon Lieutenant Commander Rachel Evershed who was [illegible] at BRNC [illegible] Physiotherapist and who produced the data for that term.

J Royal Naval Medical Service 2010; 96(3): 170-175

General

Pacific Partnership 2010: humanitarian civic assistance on a US Navy hospital ship

L Skyrme

Introduction

PACIFIC PARTNERSHIP 2010 (PP10) was a five month humanitarian assistance and disaster response training exercise involving military, host nations, partner nations and non-governmental organisations (NGOs).

PACIFIC PARTNERSHIP (PP) evolved following the reaction to the 2004 Asian Tsunami which provoked an unprecedented response from the international community. It was identified that non-governmental organisations have an increasing role in working with multi-national military and governmental agencies such a large scale disasters.

It was also noted that popular location of the US improved dramatically in the aftermath of the disaster. USNS MERCY provided an icon for the US and international aid in a predominantly Islamic and volatile country. The US Pacific Command has attached a high priority to continuing to develop the partnerships built during this period. PACIFIC PARTNERSHIP is now an annual event, alternating biannually between MERCY with a 1000 bed capacity and other amphibious, grey hulls, such as the USS PELELIU which is a more versatile platform with greater lift capability.

The mission has continued to expand and include more partner nations, NGO groups and different specialties each year. 2010 has seen the largest number of partners so far including the host nations, partner nations, NGOs and other US governmental agencies as detailed below.

Host Nations: Vietnam, Cambodia, Indonesia, Timor Leste, Papua New Guinea and Palau.

Partner Nations: Australia (including HMAS TOBRUK), Canada, France, Japan, [illegible] Korea, Malaysia, New Zealand, Portugal, Singapore and the United Kingdom.

NGOs/Others: East Meets West, Civil Force, International Relief Teams, LDS Charities, Nour International, Samaritan's Purse, Society of North American Hope, World Wide, HUMA, Operation Smile, Operation Eyes, Peace Winds Asia, [illegible] Project Handclasp, Project HOPE, Sustainable Eye Expeditions, Vets Without Borders, UCSD Pre Dental Society and World Vision.

Interagency: US Embassy, [illegible] US Agency for International Development (USAID) and US Public Health Service.

Most partner nations [illegible] waves of the mission. This [illegible] included one or two [illegible] hard-to-reach provided the [illegible] human [illegible] MERCY is run by the Military Sealift Command (MSC) which [illegible] and replenishes and supports [illegible] US Navy. The US Navy component or board is referred to as the Military Treatment Facility (MTF) and always has a skeleton crew embarked. Once MERCY deploys she has a surge of MSC staff further staff to augment the MTF as well as a Mission Commander. This year the mission was led by Commander [illegible] Dastroyar Squadron 21, Commodore Lisa Franchatti and her team. Throughout the mission MERCY had an average of 1000 personnel on board.

Mission

The aim of PP10 was to strengthen partnerships and security throughout the region. It also developed "collective preparedness of the US and partners in the event of a disaster.

A large proportion of the MSC, MTF and NGOs involved in PP10 had served on both humanitarian civic assistance (HCA) and disaster relief (DR) missions previously. Many personnel from all organisations had been involved with MERCY or USNS COMFORT, the sister ship of the same class which serves the Eastern coast including the Caribbean and South America. Medical personnel who had served onboard the smaller US Navy vessels or with the US marines had incorporated smaller scale HCA missions into their routine deployments within the units.

A recent example of such training prior to [illegible] was the response of COMFORT to [illegible] earthquake. The COMFORT had [illegible] in a number of HCA missions [illegible] the Caribbean, had acquired [illegible] knowledge of the existing infra[illegible]. The context of the mission was [illegible] of a disaster response [illegible].

[illegible] personnel with [illegible] DR experience confirmed that the organisation and execution of PP10 was almost identical to the reality on the ground of disaster on a larger scale. The same processes for transfer of equipment and personnel ashore were utilised. The same challenges of language barriers, non ideal working environments and frustrations were evident but unsurprisingly on a larger scale. The main difference highlighted was the improved utilisation of the skills and training of the Corpsmen, RN, Medical Assistant equivalents during the DR missions.

Commodore Bianchetti and her team were very proactive trying to steer the message of PP10 away from a "flag-waving" trip and instead promote the contributions of organisations from the host nations at every opportunity. The Commodore was keen to highlight that all activities undertaken ashore were done so at the behest of host nations in close liaison with local US Embassy staff. In many of the countries visited, improving diplomatic relationships were particularly significant. For example, MERCY's visit to Vietnam marked the 15th anniversary of normalisation of relations with the US.

The scale of the mission and the number of different branches across all disciplines that worked under the umbrella of PP10 was nothing short of an organisational feat.

The surgical capacity of MERCY was fully exercised with all major specialties apart from cardio-thoracics and neurosurgery represented. Elective surgical procedures were carried out onboard after a rigorous screening process. The 3-4 functioning operating theatres were fully supported by theatre staff, recovery staff as well as inpatient medical specialities and full laboratory and imaging capabilities. The radiology department had a CT scanner and interventional radiology capability.

Primary care, paediatrics, optometry and dentistry carried out most of their work ashore in community clinics or Medical Civic Action Projects. Medcaps, which projected the PP10 image across large swathes of the local population.

Public health had a prominent role within the mission and comprised largely of a workforce drawn from the Preventive Health branch of the US Navy and the US Public Health Service an arm of the uniformed services responsible to the Surgeon General. They undertook numerous Subject Matter Expert Exchanges with their counterparts on a wide range of topics including water sanitisation to disaster response planning.

This year brought the introduction of a small veterinary team to the mission. This consisted of US Army and NGO vets and assistants who were able to reach out to local communities and their animals. They carried out a variety of canine, feline and water buffalo vaccination programmes, raised the awareness of rabies and were involved in control of disease outbreaks. They also gained a valuable insight into the impact of animal health on rural farming communities

and the local economy.

US Navy Seabees and Australian Army Engineers worked together on engineering projects in all the countries. Small teams were inserted into the host country and typically worked for up to a month on projects and completed them during MERCY's missions visits. They established fresh water wells and refurbished schools, health clinics and community halls.

Many other teams were involved in the PP10 effort including a nutritional support service, vital medical equipment repair services, physical therapy, pharmacy, the US Navy band and security forces.

The cost of the mission was estimated to be approximately $25 million not including personnel wages or fuel costs for the MERCY. The investment in the mission is a reflection of the US government's placement of HCA/DR missions as the third most important defence priority.

Medicine Onboard

As a General Duties Medical Officer I was assigned to the Primary Care division of the Department of Medical Services. I was initially daunted by the prospect of being fully involved in the care of personnel onboard within a US system. This was quickly dispelled by the open and very friendly nature of all staff and also the realisation that there was full hospital capability onboard. As a GDMO there was a substantial increase in support than I was used to.

I soon discovered that a large proportion of US Navy Medical Officers, despite significant experience had never been to sea. This is due mainly to the difference in size of the US Naval medical services and the full scope of medical care they provide to the Navy population and their families under the Tricare system.

One of the main differences I noted in the US system, beyond the obvious inability to identify drugs by their generic names, was the role of nurse practitioners and physicians assistants (PAs). Nurse practitioners and PAs provide a much larger proportion of primary health care compared to the UK. PAs are not commonplace in the UK and I was surprised by the scope of their work. They undergo 2 to 3 years training and are qualified to practice medicine with the supervision of a licensed physician (doctor). They are given the autonomy to examine, diagnose, treat and write prescriptions for patients as determined by their supervising physician.

They are often employed in rural areas as a more cost-effective option to paying a fully licensed physician. The profession started in the 1960s after the US military saw the benefit of providing medical training to US Navy Hospital Corpsmen (MA equivalent) and US Army Combat Medics who had gained significant combat medical experience in the Vietnam War. The US Army continues to use PAs to provide most primary and emergency care at the battalion level. Within the Canadian and US Army, the natural career progression for a Combat Medic or Medical Technician is to progress through the ranks and be selected for PA training. The US Navy do not utilise as many PAs and instead have an Independent Duty Corpsman (IDCs) programme. IDCs are the senior care providers onboard frigates and destroyers with GDMOs found onboard larger amphibious vessels. I think that both programmes gave personnel an option to progress and use their considerable military and clinical experience in a frontline clinical role.

The primary care team consisted of family physicians, internal medicine physicians, nurse practitioners, PAs, Navy residents in training, Corpsmen, Canadian MedTechs and pre medical students. The diversity was an ideal skill set for humanitarian missions where much of the workload is basic primary care and reassurance.

Despite broadly similar training to our Medical Assistants, Corpsmen skills varied considerably. This is largely due to the fact they undergo sub specialisation immediately after their basic training and often hold niche jobs within a large hospital environment. Only a minority of junior Corpsmen gain an opportunity to provide primary care in a maritime environment.

The department was hugely supported by

groups of [illegible] throughout the mission [illegible] skills dedicated to [illegible] cataract surgeons. They have [illegible] program manager [illegible] Expeditionary [illegible] and paramedic [illegible]

Medcaps

The Medical Civic Action Program (Medcap) provided medical care to the [illegible] They aimed to provide [illegible] medical care to the local population [illegible] have at least [illegible] pharmacy and additional [illegible] potential are often augmented [illegible] local therapy. Surgical candidates were initially identified on the first day in the [illegible] port, although there will often be some cases on the operating lists. More demanding surgical procedures required to be scheduled within the first few days at each mission port following only minor low risk procedures on the last few days. Any candidate referred to the ship underwent a rigorous anaesthetic screening and a screening X-ray to exclude tuberculosis. This required a further convoluted support network to track the patients.

Optometry teams offered pre-surgical glasses and sunglasses. Some patients with severe bilateral cataracts and myopia were unable to be referred back to the MERCY for sample visits. They were often the most in demand specialty, particularly once word had passed around the village that there were free sunglasses to be had. It was not uncommon to see a coach or three to see many hundreds of patients in a day. The impact to patients of such a seemingly simple intervention cannot be underestimated.

Dental teams offered tooth extraction and hygiene services. In our first visit mission to Vietnam there had been high hopes that the generator would able to power more advanced tools and drills. Unfortunately the generator was unreliable and soon abandoned. It was soon realised that advanced tools and technical root canal work was not required. The standard of dental care was [illegible] and patients [illegible] tooth [illegible] with pain relief in most cases.

[illegible] were normally split between [illegible] and [illegible] traditional [illegible] to military.

The Joint [illegible] volunteer in an [illegible] Civil [illegible] Expeditionary Syndrome (HMES) software designed [illegible] medical [illegible] were tagged with a wristband [illegible] barcode on entering the MEDCAP site. This barcode was then scanned by the PDA and patients flowed through the site starting at administration and invariably finishing at pharmacy. PP10 was the first large mission that the CHIMES system had been trialled and full time contractors were employed to man the wireless bubble throughout the mission. Many providers found that the system slowed down their progress with patients compared to the paper system.

Most MEDCAPs were daily missions where equipment was carried ashore on an early seaboat (lots of 0500 starts). The dentists often had the most kit to carry as despite abandoning their generator they still had to carry and sterilise their equipment daily. As PP10 progressed transporting boxes of equipment and medication became an ever smoother operation.

The highlights of my trip were the Remain Over Night missions or RONs. I was fortunate to be selected to participate in RONs in Cambodia, Indonesia and Timor Leste. These trips often involved up to a week away from the ship and were an excellent opportunity to interact more closely with village life in remote destinations. Of my more memorable experiences was many nights spent in the "tent city" which is probably the most impractical sleeping system I have ever encountered. It was a combined camp bed, mosquito net and tent. Unfortunately it became an "easy bake oven" in the stifling heat of the tropics and proved an excellent water container as it had neither

waterproofing quality [illegible] and sleep deprivation [illegible] excellent team building.

I felt most at home during my stay on HMAS LABUAN, a Royal Australian Navy landing craft (heavy). Despite more than doubling their crew of 20 we were warmly welcomed. I appreciated some friendly accents where no-one mistook me for being an "Aussie" and of course the heated Uckkers tournament. Due to very tight accommodation I had the surreal experience of sleeping in a "tent colony" on the open air tank deck. It was worth the sweating and sleep deprivation just for the swim calls in pristine Indonesian sea and fantastic scran.

The weeks away helped us to build a rapport with our interpreters which hugely improved our communication with patients. I saw a huge array of medical problems, many of which had been left untreated. I saw tropical diseases such as leprosy, tuberculosis, HIV and an array of fungal infections. Unfortunately there was often very little care I could offer to patients. Much of my role with the MEDCAPs was to offer small snippets of patient education and provide reassurance for patients. The most common presentations were headache, heartburn and musculoskeletal pain, much in keeping with general practice in more developed countries. Patients often expected a surgical cure onboard the MERCY for chronic medical conditions. These expectations were often difficult to manage. With each new wave of providers often struggled to come to terms with routine denial to the ship for further care. This was anticipated in part by the US Navy and small workshops discussing humanitarian stress were delivered regularly.

The corpsmen, medtechs and nursing officers were the utilised mostly to control traffic flow within the MEDCAP site. Careful planning and management were key at the risk of small riots developing as huge crowds formed desperate to be seen by the western doctors. The corpsmen were removed from clinical work and were occasional called upon to do a set of vital signs or simple dressings. I felt that their role had the potential to be increased and they would be better utilised to treat simple cases and refer the more complicated cases to physicians. Many providers of MEDCAPs were under pressure to see patients very quickly. On occasion when demand was at its height providers were known to see over 200 patients with in a day. This obviously impacted on the quality of care achieved. Civilian pre medical students who had completed undergraduate degrees but not yet applied to medical school were given priority to shadow the providers and get involved with patient care above the corpsmen. I felt that this was not fair to many of the highly trained and capable corpsmen and medtechs who require this valuable experience.

Conclusion

Achievements of PACIFIC PARTNERSHIP 2010

- 101 662 patients seen ashore
- 1580 patients seen afloat
- 807 surgical cases
- 110 endoscopies
- 57546 pairs of glasses
- 2678 animals seen
- 24 670 hours of Subject Matter Expert Exchange
- 18 engineering projects
- 62 community relations projects
- 6 concerts
- $5 867 900 of biomedical equipment repairs carried out

I personally gained a lot from my three and a half months onboard where I was actively encouraged to gain experience in all aspects. I saw over 1000 patients during MEDCAPs and had exposure to a completely different side of medicine. I gained anaesthetic experience and was supervised initiating patients onboard. I even qualified as a Surface Warfare Medical Department Officer or SWMDO. I think it was an excellent opportunity to gain practical HCA experience which despite readiness and training for disaster relief is often rare within our military today.

Despite the tangible achievements, my

trip will be most memorable for the last ng friendships I have made. PP10 was a true multi-national exercise in every sense and opened my eyes to the way different military es function. I think that other allied professions particularly RN Medical Assistants and nurses would also benefit from such an experience. The PACIFIC PARTNERSHIP mission could also be opened up to all three services as it is very much a tri-service exercise for all other nations.

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J Royal Naval Medical Service 2010; 96(3): 175-184

General

'Lessons learnt from America' - Reflections from a fellowship examining the prevention, recognition and treatment of operational stress injuries in US Army serving personnel

Matthew Wesson

Background

The Winston Churchill Memorial Trust awards 100 fellowships a year over 10 distinct categories to members of the UK that can demonstrate how their travels can benefit themselves, their community and the country. Fellows receive a travel grant to cover return and internal travelling, daily living and insurance within the countries visited. In 2009 I was awarded a Winston Churchill Travelling Fellowship under the category 'The Treatment and rehabilitation of traumatic injuries' and was able to spend this 4 weeks working in military facilities in Washington DC and San Antonio, Texas with the aim of broadening my knowledge in this area and to bring back what I learnt for the benefit of myself and the UK Defence Mental Health Service.

I am a Cognitive Behavioural Psychotherapist, EMDR Consultant and Registered Mental Health Nurse. I have been in the Royal Navy for nearly 18 years and am a Lieutenant within the Queen Alexandra's Royal Naval Nursing Service. My clinical role is to provide mental health assessment and treatment to serving military personnel. I have completed operational tours of Op Telic (Iraq) and Op Herrick (Afghanistan). Since the late nineties I have had a particular interest in the treatment of traumatic stress. I have presented at international conferences and been published on the issue.

Fellowship Aims

When I applied for the fellowship my original aims were as follows:

1. To carry out a study of how the US Army Medical + Behavioural Health Services prevention and treatment of traumatic stress injuries in the serving personnel.
2. To exchange ideas, knowledge and information with my American colleagues around the prevention and treatment of post traumatic stress injuries in armed forces personnel.
3. To spend time with the US Army's Medical and Behavioural Health Services and other related agencies in achieving the aim.

Traumatic Stress Injuries and the Military

Military personnel who are exposed to traumatic events during operations are at risk of developing symptoms of traumatic stress. Such psychological reactions have a long history within the military. They have been recognised as far back as the American Civil War as 'irritable heart', in World War I as 'soldier's heart' or 'shell shock', and in World War II as 'combat neurosis' (1). The Vietnam War caused record numbers of soldiers to develop traumatic stress problems as a result of their experiences in combat (2). However, Post Traumatic Stress Disorder (PTSD) was not officially recognised until the third edition of the Diagnostic and Statistical Manual (3) where it was classified as an anxiety disorder. PTSD is thought to develop

when the person processes the traumatic event and its consequences in a way that generates a sense of current and serious threat (4). More recent research in military personnel has shown that soldiers who have deployed to Iraq or Afghanistan are at a high risk of developing mental health problems including traumatic stress injuries such as PTSD (5 6).

Now that traumatic stress injuries and PTSD are recognised as inevitable consequence of modern warfare there is much interest into how this can best be managed. A variety of approaches is often taken. The importance of early detection in PTSD has been widely acknowledged (7 8 9) and authors have indicated the potential benefits of early intervention (10 11 12). Therefore education and training programmes are often used to improve the recognition of post traumatic stress reactions to ensure prompt treatment where appropriate. They are also used to encourage help seeking behaviour and reducing the stigma often experienced when asking for help. Once diagnosed, factures should be set up to provide the most effective treatments to serviceman or women, hence giving them the best chance of recovery.

Within the UK the National Institute for Health and Clinical Excellence (13) has issued PTSD treatment guidelines detailing which approaches have the strongest research base demonstrating their efficacy. These include Cognitive Behavioural Therapy (CBT) models and Eye Movement Desensitisation & Reprocessing (EMDR). The US produce a lot of the research in the area or combat related PTSD and their military are pioneers in the prevention of traumatic stress injuries, so it was my first choice as the location for my travelling fellowship.

Itinerary Outline

Sat 14th Nov	*Depart UK / Arrive Washington DC*
Mon 16th Nov	*Walter Reed Army Institute for Research (WRAIR) Silver Spring*
Tue 17th Nov	*Prince George's County Police Department Mental Health Team*
Wed 18th Nov	*Defense Center of Excellence (DCoE) Rosslyn and Silver Spring*
Thu 19th Nov	*National Naval Medical Centre (NNMC) Bethesda*
Fri 20th Nov am	*National Intrepid Centre for Excellence (NICoE) Bethesda*
Fri 20th Nov pm	*Centre for the Study of Traumatic Stress (CSTS)*
	Uniformed Services University of Health Sciences (USUHS) Bethesda
Mon 24th Nov am	*Chaplaincy Department Walter Reed Army Medical Centre (WRAMC) Silver Spring*
Mon 24th Nov pm	*Outpatient Psychiatry Ward 53 WRAMC*
Tue 25th Nov	*Trauma Recovery Programme Outpatient Psychiatry Ward 53 WRAMC*
Wed 26th Nov	*Trauma Recovery Programme Outpatient Psychiatry Ward 53 WRAMC*
27th – 30th Nov	*Thanksgiving Weekend*
Mon 1st Dec	*Psychiatry Consult Liaison Service (PCLS) WRAMC*
Tue 2nd Dec	*WRAIR*
Wed 3rd Dec	*Travel to San Antonio (SA) Texas*
Thu 4th Dec	*Battlemind Training Office Army Medical Department Center & School (AMEDDC&S) Fort Sam Houston SA*
Fri 5th Dec am	*Department of Community Mental Health Warrior Transition Unit (WTU) Fort Sam Houston*
Fri 5th Dec pm	*Center for the Intrepid Fort Sam Houston*
Thu 10th Dec pm	*Army Center for Enhanced Performance (ACEP) Fort Sam Houston*
Mon 7th Dec	*Combat Operational Stress Control (COSC)*
Fri 11th Dec	*course Hilton Doubletree San Antonio*
Sat 12th Dec	*Depart SA Texas*
Mon 13th Dec	*Arrive UK*

Reflections and Recommendations

Operational Stress Briefings The area I was most impressed with when investigating the US Army's strategies around the prevention of traumatic injuries was the Battlemind project (soon to become Sustainment Resilience Training under the Comprehensive Soldier Fitness Programme). Battlemind brings together all educational aspects of traumatic and deployment stress in a single coordinated and corporate approach. The Battlemind approach encourages the utilization of a soldier's resilience instead of being based on an illness model that is the basis for many other stress education lectures. Elements of the Battlemind programme have been shown to be effective at reducing post traumatic stress and depressive symptoms and lower levels of stigma (14). The UK mental health services are now trialling the post-deployment Battlemind briefings with troops returning from operations and we await the outcome.

All the Battlemind presentations and associated materials are standardised and professionally produced. The accompanying website is modern and engaging. They have produced briefs not only for pre and post deployment but also life-cycle briefs for delivery through the service person's career and also briefs for families to help with post deployment transition. As a result the Battlemind product is known and accepted throughout the Army as standard procedures in the management of traumatic and deployment stress.

The US Army now has a Battlemind training office based in the Army Medical Department & School aimed at training fellow mental health practitioners how to deliver these briefs. However an acknowledged drawback is that they do not have a system currently in place to monitor the ongoing delivery of these briefs once the initial training is complete. Therefore they can not guarantee quality control of the briefs. UK research has shown that poorly delivered briefs are worse than no brief at all (15).

Recommendation The UK Defence Mental Health Services develop a standardized corporate and professional package which incorporates all briefings involved in operational stress management along with associated materials (e.g. handouts, leaflets and website). Once this is implemented the delivery of the briefs are regularly monitored and evaluated to ensure that high standard presentations are maintained.

Traumatic Event Debriefing Following some research that showed individual psychological debriefings is not effective and can even be harmful to victims of traumatic events (16,17,18). In 2000 the UK Surgeon General decreed that debriefings should not be used in the UK military (19). However in contrast group debriefings are still widely used in the US military after traumatic events and are usually facilitated by US military mental health practitioners. Within the Army this is usually in the form of a Battlemind Debriefing. They point out that the previous research was carried out following debriefing individuals and that there are significant benefits to using group debriefing within a military environment. It is seen as being consistent with the occupational context of the armed forces, can enhance the group support process, normalises responses and takes a recovery model approach. There is also now evidence pointing to the effectiveness of Battlemind debriefing in reducing post traumatic stress and depressive symptoms and sleep problems with military personnel (20,14).

In the UK military the equivalent of Battlemind debriefing is Traumatic Risk Management or TRiM. This is a peer led risk assessment process and is similar to Battlemind debriefing in many ways. They both minimise the degree to which the traumatic event are recounted (therefore reducing the chances of retraumatising) but instead focus on resilience and recovery from the traumatic event. Research of TRiMs effectiveness has showed that it is neither harmful nor beneficial to psychological health or stigma but there were some modest occupational benefits, however the trial was not carried out in a hostile environment where it is likely to be of most benefit (21).

TRiM risk assessments are usually carried out by fellow peers and not medical or mental health practitioners. This has the advantage that service personnel are more likely to speak openly in front of peers and also avoids medicalising normal post trauma responses. However, peer risk assessment is not always appropriate and available on operations.

Anecdotal evidence from my operational experience is that somatisation is not a peer available because the entire unit has been affected by an incident. Sometimes personnel prefer to have a professional outsider facilitate the debrief instead of a peer from HQ who they may worry is more concerned with whether correct protocols were carried out during the incident than how the team is coping. In addition, often medical personnel are involved in traumatic events and will seek the support of their mental health colleagues who they consider their peers. Therefore it may be time to broaden the potential scope of TRiM to include the training of all deployable military mental health practitioners to advanced and preferably instructor level. This would enable them to be able to provide knowledgeable input to traumatic event management including where appropriate TRiM risk assessments.

Recommendation. The feasibility of training all deployable military mental health practitioners to an advanced or instructor level in TRiM should be investigated.

Mental Health Practitioners Pre-deployment training. During my travelling fellowship I was lucky enough to attend the Combat Operational Stress Control Course. This is the pre-deployment training that all their Behavioural Health (Mental Health) clinicians attend including psychiatrists, psychologists, social workers, psychiatric nurse and psychiatric technicians amongst others. It even includes Chaplains and Chaplains assistants. It was a week long course that involved many aspects of providing mental health care on operations.

Although I don't think we would require a week long training package for our Field Mental Health Team members prior to deployment, I do think we should have more formalised pre-deployment training than is currently offered. The new operational competencies should help with pre-deployment training. I am also aware that there are now more mental health scenarios within the pre-deployment medical exercise at Strensall Camp, which is definitely a good thing. Those scenarios should also include not just the medical management of issues but how to liaise effectively with command on how to manage personnel with mental health problems in theatre. This can be particularly useful for junior staff in an FMHT or for reservists who may not have experience from their NHS work in the types of liaison required on operations.

Also, from my experience of the pre-deployment training at Strensall Camp, there are aspects of the week's programme which are not particularly relevant to members of an FMHT. Therefore, there may be the possibility to include specific pre-deployment briefs for the FMHT during these slots instead. Standardised pre-deployment reading material could be provided to the FMHT as well to assist in their professional and personal preparation. I acknowledge that there is the Operational Mental Health course available for military nurses, however this is not delivered as a pre deployment programme and is only attended once in the person's career. Pre-deployment training has the benefit that it is delivered very soon before the nurses' operational tour.

Recommendation. To investigate into whether there can be more specific and standardised pre-deployment training for members of an FMHT each time they deploy.

Mental Health Training and Education. Along with Battlemind the US Army's training of personnel on mental health issues appeared to be far more centrally coordinated and professionally produced than that of the UK military. In addition to Battlemind they have other projects that aim to increase soldier's knowledge and recognition of mental health problems, as it is acknowledged that stigma is

a major [illegible] seek help. O[illegible] programme [illegible] a peer led system [illegible] stress. It involves training non medical personnel in being able to spot difficulties in their colleagues and signpost them towards help. This is in recognition of the limited number of behavioural health providers in the US Army compared to the amount of troops and is another way of helping getting soldiers the right kind of help when needed.

The UK may not need to go as far as this system but we should certainly be looking to increase the knowledge and skills of our medical assistants as they are in the front line of medical support to service personnel. They should be able to better recognise mental health problems and know when and how to signpost them to the appropriate help. Current in service education of medical professions on issues around military mental health is ad hoc and varies in quality and content. There is a need to standardise the content and structure of the briefs so we can ensure parity across all of the UK Defence medical services. Now with a lead service heading up UK Defence mental health this may be the time that we have the coordination across the three services to make this possible.

Recommendation. The training of medical professionals in military and operational mental health needs to be standardised.

In theatre Operational Mental Health Surveys. One tool that an Operational Stress Control Team (Field Mental Health Team equivalent) has is the ability to carry out simple in theatre surveys of mental health issues in units at the request of Command. This allows them to give feedback to the executive on issues such as morale and the current concerns amongst their troops during stages of a deployment. If requested by Command they can then offer suggestions or resources to help improve these areas. Due to the limited numbers of clinicians in a FMHT this may be more difficult to put in place for the UK. However it is worth investigating whether something could be designed which is not too labour intensive (e.g. using analysis software) but can still give useful and current feedback to Command. If we have this facility it could help to create positive links to the Command which is an important role for any operational mental health team.

Recommendation. The feasibility of designing and carrying out in theatre FMHT surveys should be investigated.

Warrior Adventure Quest. This is a project that uses high adrenaline adventure training opportunities coordinated with mental health input to help improve morale, unit cohesion and teamwork and manage risky behaviours. It is used both pre and post deployment and importantly it includes mental health aspects like homecoming/readjustment briefs and practicing after-act on debriefs. Adventure training is often carried out by UK units when they return from post deployment leave. This could provide another good opportunity to incorporate TRiM strategies or mental health briefs into this evolution.

Recommendation. Incorporate aspects of WAQ into units post-deployment adventure training.

Positive Psychology and Enhanced Performance. Overcoming the stigma of mental health and help seeking have been shown as significant issues for US and UK armed services (5 22) with many service personnel not even knowing that a Defence Mental Health service exists. My visit to the Army Centre for Enhance Performance demonstrated to me that this is an area that defence mental health could exploit to improve our profile and publicise our services in a positive light. Many practitioners in defence mental health already have skills in areas such as visualisation, relaxation, stress management, goal setting and mindfulness and therefore courses or briefs in positive mental health and performance enhancement could be generated and delivered with our current expertise. I realise many clinicians

already struggle with high workloads and caseloads, however if resources were increased in the future this could be an area of potential development.

Recommendation. UK Defence Mental Health services to consider offering briefs and education in positive psychology and performance enhancement to help reduce stigma around mental health and advertise the UK Defence Mental Health service.

Evidence based treatment approaches. I was impressed that both countries' mental health facilities were largely providing evidence based treatment for PTSD. However I did get the impression that the US clinicians were more committed to regularly reviewing those individual and group treatments and altering them in line with new research and also in using their clinical findings or outcomes to publish their own research findings. They also had their own trainers that could run courses in the military versions of Eye Movement Desensitisation and Reprocessing, Cognitive Processing Therapy and Prolonged Exposure. In spite of this, they did acknowledge they struggle to ensure clinicians facilitating groups or carrying out individual therapy were consistently delivering to high standards of care in accordance with treatment protocols.

I feel we should have mechanisms in place to ensure that evidence based approaches are being used and that there is some quality control to ensure treatment fidelity. Regular use of live supervision of clinicians treatment sessions should be mandated to help with this. The new NHS Improving Access to Psychological Therapy (IAPT) programme (23) has shown that this is possible and we could look to mirror their processes to assist in setting this up. Also, regular and centralised guidance should be issued to DCMH on developments in traumatic stress injury treatment approaches.

Recommendations. The use of live supervision should be mandated for PTSD treatment sessions to ensure treatment fidelity. Regular centralised guidance should be issued on developments in PTSD treatment. The UK Defence Mental Health Service should be giving clinicians the opportunity to become trainers in PTSD treatment so we no longer have to buy in that training. Opportunities should be to carry out PTSD treatment outcome research within DCMHs.

Outcome measures. The treatment facilities and programmes that I visited during my fellowship were clearly committed to monitoring outcomes. This was usually using standardised and empirically validated questionnaires. The practice in the UK is much more variable and usually dependent on the individual clinician or local DCMH policy. I am aware that this issue is currently being investigated however, we could potentially start collecting useful outcome data now. This could easily be done by mirroring the free measures currently being used within IAPT services (24). These simple questionnaires measure symptoms as well as occupational and social functioning. We could quickly produce valuable data on the effectiveness of interventions which could help to shape the future provision of services.

Recommendation. All DCMHs should start to collect uniform outcome measures in line with IAPT services, whilst we await more formal guidance on this issue.

Wounded Warriors. An interesting observation from my visit was that the US Army split their military medical services, including their mental health services, between deployment and non-deployment related injuries and conditions. Their deployment related injuries are all under the umbrella of the 'wounded warrior' services and are clearly very well supported and funded. Their non-deployed services include care for families and dependents. I did not spend any time with the latter services, so cannot comment on their standard of provision, but they weren't as well advertised as wounded warrior services. In the UK we could consider whether post traumatic injuries from operations have priority on

mental health treatment is a trigger. Splitting services is an interesting concept. In reality I think they are probably benefits and disadvantages for both systems but perhaps this does warrant some consideration.

Recommendation. Consideration given to the prioritisation of operational mental health injuries over non-operational mental health problems.

mTBI. This is a potentially controversial area. There has been research both in the US and UK stating that although mTBI or mild concussion syndrome symptoms are common, their associations are complex and involve more than just blast exposure (25,26). Numerous associations with other disorders such as PTSD, depression and physical health problems have been shown, therefore screening is not recommended. However, the efforts and finance that are going into the area of mTBI in the US is staggering. As stated earlier, they consider mTBI as one of the signatures of the wars in Iraq and Afghanistan. Whether they are creating a potential problem for themselves is yet to be seen.

Due to the high profile of mTBIs this might be leading veterans to convincing themselves that they have an mTBI and subsequently seek treatment or compensation for it, where they may be suffering another condition that could be effectively treated. Even using the term mTBI alludes to a serious condition that they may not occur if the term concussion was used instead. However, it is important that we watch US developments in this area. Gulf War syndrome showed us that issues such as this (which often originate in the US) can be seized on by the UK media causing significant problems for our military medical services.

Recommendation. The UK management of mTBI or mild concussion syndrome should not change at this time but we should keep track of the research and developments coming out of the US due to this condition's high profile.

Sleep research. Sleep is a vital part of a service persons function, in whilst on operations. The WRAIR sleep laboratory has been producing important research that has been used to generate guidance and policy on sleep management for use throughout the US Army. This has then helped to dispel certain myths often held by those in command around sleep. For example, their research has shown that ability to carry out mental and physical tasks decreases significantly if someone is consistently getting less than 7 hours sleep per 24 hours (27), which is contrary to the widely held belief amongst Command that soldiers can effectively function on 4 hours sleep per night. They also demonstrated that banking sleep prior to subsequent sleep restriction periods reduces impairment and improves recovery (28). These are important findings that Command should be made aware of. Future sleep research at WRAIR will be looking at what are the optimum times to get this sleep within a 24 hour period (e.g. 2 × 4 hours which are line with a persons circadian rhythms).

Recommendation. The development and standardised Sleep Management guidelines for use within the UK military based current research and the recommendations of WRAIR and the US Army.

Formalised Restorative Packages. The US Army's Combat Operational Stress Control teams offer formalised in-theatre restorative (24-72 hours) and reconditioning (up to 7 days) packages to those suffering the effects of combat stress injuries or combat fatigue. Both allow short term rest and recuperation but focuses strongly on return to the soldier to duty afterwards. This may be useful to include similar guidance within the standard operating procedures (SoPs) of a FMHT.

Recommendation. Consideration given to the inclusion of Restoration and Reconditioning programmes into the SoPs of the FMHT.

Bio-feedback. Although relaxation techniques are not a recognised treatment of PTSD, the

ability to self sooth is an important skill for many patients to master before embarking on PTSD treatment. Bio feedback is used a lot in the US as an adjunct to PTSD treatment and all the clinicians that use it were very enthusiastic about its benefits for patients. The utility of this technique in the UK should be further investigated with at least one DCMH installing the equipment and report back on their findings.

Recommendation. Bio feedback machines to be trialled in a DCMH as an adjunct to evidence based PTSD treatment to see if it increases the efficiency and effectiveness.

Virtual Reality PTSD treatment. This is currently being trialled in the US and it may have utility with combat related PTSD as a novel and effective treatment. The findings of the trial will be published in due course.

Recommendation. We should consider the recommendations and conclusions of this trial to see whether we should consider using it in the UK as an adjunct to other PTSD treatment as an approach in its own right.

Hypnotherapy. This was used heavily by the Psychiatric Liaison Team in the management of pain and anxiety in physically injured service personnel. Clinicians and patients alike were very positive about its use.

Recommendation. The evidence base for the use of hypnotherapy for pain relief in physically injured patients should be reviewed to see whether the military community mental health nurses working at places like Queen Elizabeth Hospital Birmingham and DMRC Headley Court should be trained in this technique.

Group Therapy. Group therapy was used a lot in the treatment facilities in the US alongside individual exposure work for PTSD. They provided peer support and a psychoeducational aspect to individual treatment plans. It is doubtful whether any UK DCMH receives enough PTSD referrals to run a trauma recovery group but some DCMHs do run groups of other kinds. For example DCMH Portsmouth run structured closed groups for anxiety and anger management. They also run an open and unstructured support group. There is a lack of evidence for the effectiveness of the latter type of group. What the Trauma Recovery Groups in the US demonstrated to me is that you can have effective open but structured group therapy which can be based around a fixed weekly programme incorporating evidence based approaches.

Recommendation. Consideration should be given to making the DCMH Portsmouth Support Group an open but structured weekly group programme based on evidence based approaches such as CBT in helping people manage problems like low mood, motivation and poor sleep.

Summary

These are my personal views and reflections from a hugely rewarding experience. They are not opinions or recommendations of the MOD or any other institution I am associated with. I realise that there may be various logistical reasons why my recommendations cannot be carried out, however I do hope that some will be able to be put into place. If nothing else I gained a massive amount from my travelling fellowship and it has already had a positive impact on my own clinical work. I hope to continue to pass on what I have learnt from the fellowship for many years to come. A special thank you goes to the Winston Churchill Memorial Trust for providing me with this fantastic opportunity and everyone who helped me before and during my visit.

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J Royal Naval Medical Service 2010 96 3 185 187

History

Surgeon Captain Sheldon F Dudley and the person to person spread of brucellosis by inhalation

H V Wyatt

Abstract

Analysis of brucellosis epidemics in ships [illegible] the Mediterranean fleet in the nineteenth century are most easily explained by aerosol transmission in noisy overcrowded hot and humid confined spaces.

Introduction

Brucellosis may well be the disease most easily acquired in the laboratory. Almost all workers with the bacteria have been infected and almost all veterinarians who have had contact with susceptible animals have high titres of antibodies against the bacteria. The members of the Mediterranean Fever Commission (MFC) in Malta all had episodes of ill health but whether this was from the bacterial cultures or from goats' milk is not clear. Captain Hughes was in Malta from 1890 until he was invalided to Britain with brucellosis in 1896. In the preface to his classic book on the disease he recorded that his wife and two sisters had also contracted the disease(1). He recommended goats' milk for army hospital patients with brucellosis. Captain Dudley RN commented that in the navy in the 19th C fresh milk was essentially a wardroom luxury: the men did not get milk on board and probably rarely drank goats' milk ashore. Officers were more frequently infected with brucella than men (2). This was probably the case for army officers too.

In the 1950s Francois Jacob invited the other members of the Institute on the annual pilgrimage to Pasteur's crypt. Among the Pasteurians was the one to whom all France sent microbes that were hard to characterize and who made his diagnosis by smell: sniffing [illegible] cultures [illegible] 3. While [illegible] worked [illegible] hospital [illegible] staff opened the [illegible] of cultures [illegible] the [illegible] some bacteria [illegible] connected by [illegible] tubes. The [illegible] of [illegible] 131 Captain Dudley R [illegible] that [illegible] could [illegible] transmitted by droplet infection.

Brucellosis in the Mediterranean Fleet

Surgeon Captain Sheldon F Dudley RN Professor of Pathology at the RN Medical College at Greenwich gave the 1931 Milroy lectures which were printed in the *Lancet*. The third lecture was on brucellosis (Undulant fever) in the 19th century but this paper has probably been overlooked and forgotten. He traced the outbreaks of brucellosis in ships of the Mediterranean fleet in the later half of the 19th century when they had been at sea for many weeks. In 1882 two ship epidemics accounted for 42 % of the fleet cases. One of these ships was HMS *Superb* which had 136 cases, 77 of whom were invalided home and one died: typical undulant fever figures. The Medical Officer gave the spatial distribution of the cases.

The ratings in the *Superb* slept on three decks. The flying deck was a kind of huge shelter

Deck	Ventilation [illegible]	[illegible]	[illegible] fever
Flying	worst, fowest cubic space per man	140	29
Lower	[illegible]	196	17
Battery	better and relatively spacious	250	10

Table. Fever on HMS Superb

cutting part of the lower deck horizontally in two

Strange Epidemics

His graph of illnesses in the Mediterranean Fleet showed that peaks of fevers frequently coincided with those of rheumatism. For individual ships there were also strange epidemics where there were coincident peaks of rheumatism and pulmonary disease. He noted that the naval commentator of the 1856 report writes that the prevalence of fever in the [HMS] Hannibal for a period of two years can only be ascribed to the successive transmission of the disease by infection from one set of men to another. Dudley noted that cases before 1897 (when diagnosis of Mediterranean Fever was first used) were often described as phthisis or inflammation of the lungs. Phthisis was used to describe the progressive wasting disease, especially of pulmonary tuberculosis since the use of [illegible] is no longer used.

HMS *St Jean D'Acre* and *Crassy* both suffered the same peculiar disease. In the first ship 416 out of 880 men suffered from pulmonary illness while the latter had 285 cases with 102 were definitely diagnosed phthisis and 117 cachexia [illegible] 112 of these were invalided home [illegible] died. The cases from both ships quickly recovered on their return to England [illegible] of the pulmonary [illegible] of Malta fever seen in more [illegible] times.

HMS *Carpo* recorded 54 pulmonary [illegible] 12 of which were phthisis. This [illegible] was attributed to bad ventilation [illegible] Dudley then reprinted the [illegible] of the lower deck in her sister ship [illegible] *St D'Acre*.

[illegible] ships company amounting to [illegible] slept on this deck. The [illegible] were placed ordinarily at [illegible] inches apart [illegible] less than the average breadth of the men's shoulders, consequently while in harbour when no watch was required at night and all hands had turned in, they formed a compact mass close beneath the hatchways, the only air available for respiration being above them, that beneath the hammocks being almost entirely shut out from the space above. All the ports as well as the small round scuttles were kept closed at night. Further details followed.

Dudley concluded that it would seem that in this environment Brucellensis had acquired the power of spreading by droplet infection, this unusual form of pneumonic undulant fever became temporarily able to spread by droplet infection in the relatively spacious wards of the Malta Naval hospital [at Bighi].

Aerosol From a Monkey

Aerosol infection had been suggested by an incident in Malta during the researches into transmission of the disease by the MFC. Captain Kennedy RAMC noted that. One of the monkeys had become very knowing and learnt to shut his nostrils when the dust was being blown in by means of a rubber bag. One day the attendant [RAMC] instead of using the rubber squirt put his mouth to the tube intending to blow it in himself. Unfortunately for him the monkey blew first! A fortnight to 3 weeks later he was sent to hospital with an attack of fever. Whether the infection was really contracted by him in this way cannot be absolutely decided, but he himself blames the dust (4).

Later Career

Sheldon Dudley (1884 – 1956) became Surgeon Vice Admiral, Medical Director General of the Royal Navy 1941 – 1945. He was made KCB and OBE and was elected Fellow of the Royal Society in 1941(5). He was given many honours both here and abroad and won many prizes for his researches. Dudley's work at Greenwich can with justice be claimed to have made possible the success of the national campaign for diphtheria immunization. In his retirement he wrote two books: *The four pillars of wisdom* and *Our national ill health service*.

Discussion

Dudley wrote three special reports for the Medical Research Council including *The spread of droplet infection in semi isolated*

comm [illegible] His analysis of the droplet [illegible] ellosis was therefore part of a [illegible] From the naval health reports of [illegible] he concluded that prior to 1850 [illegible] been little or perhaps no brucellosis [illegible] Mediterranean Fleet. The first recorded [illegible] disease was in the ships carrying [illegible] from the Crimea to Malta [illegible] that the ship epidemics was [illegible] droplet infection quoting Bordet [illegible] and signs in the lungs as a common complication of ordinary brucellosis [illegible] with remarkable accuracy. He quoted that *Brucella melitensis* had been recovered from the sputum of patients resembling clinical phthisis which was seen in an epidemic of undulant fever at Naples.

Dudley was a notable Professor of Pathology and a perceptive naval surgeon. His analysis of those far off epidemics was far sighted but unheeded. These and other arguments make his explanation of droplet infection accurate and convincing. Recent epidemics confirm that inhalation brucellosis happens. For instance, airborne transmission of bacteria caused an outbreak of brucellosis among laboratory workers in Spain in 1982(6). Droplet infection between humans seems very unlikely in ordinary circumstances but conditions in detention camps and prisons in many countries make it a real risk even in these times.

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Service News

Honours, Awards and Citations

Operational Service Medals OSM Afghanistan with Clasp

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Surgeon Lieutenant Commander J I Robin Royal Navy
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PROMOTION

Surgeon Commander to Surgeon Captain

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Surgeon Commander (D) P F Culwick Royal Navy

Acting Surgeon Commander to Surgeon Commander

Acting Surgeon Commander A M Nelstrop Royal Navy
Acting Surgeon Commander P J B Coates Royal Navy
Acting Surgeon Commander K Prior Royal Navy

Surgeon Lieutenant Commander to Surgeon Commander

Surgeon Lieutenant Commander M J Turner Royal Navy
Surgeon Lieutenant Commander V J Price Royal Navy

Operational Medal Presentations

Surgeon Captain Brown, MOIC INM presenting Surgeon Lieutenant Commander Robin Rosa, Navy with OSM Afghanistan with Clasp

Surgeon Captain Brown, MOIC INM presenting Surgeon Lieutenant Commander T Bonner, Royal Navy with OSM Afghanistan with Clasp

Surgeon Captain Brown, MOIC INM presenting Lieutenant J N [illegible] Royal Navy with OSM Afghanistan with Clasp

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Obituary

Surgeon Rear Admiral (D) Albert Edward (Ted) Cadman CB LDSRCS(Eng)

1918 - 2010

Born on 14 October 1916 and educated at Dover Grammar School Ted Cadman qualified at Guy's Hospital Dental School in 1941

During his time at Guy's which was close to London Bridge he experienced the night raids on London docks during the Blitz On many such nights he acted as a firewatcher including on one occasion when a stick of 250lb bombs hit the hospital causing extensive damage

In May 1942 he joined the RNVR as a Temporary Surgeon Lieutenant (D)

During his New Entry courses at HMS Barracks Portsmouth he vetting an exposed to the German air raids this time on Portsmouth Dockyard

Transferred to HMS COLLINGWOOD at Fareham he was once again on the receiving end when during one raid a bomb hit one of the mess huts causing many casualties

It was probably with some relief when later that year and after an arduous rail journey to Scotland he found himself embarked on *SS Aquitania* bound for the United States

Arriving in New York, he was assigned to the dental clinic in a newly established RN training facility at Asbury Park a small city in New Jersey a short distance south of New York City Amongst his colleagues in the busy dental clinic (they treated upward of 600 Royal Navy patients a month) he met Surgeon Lieutenant (D) K E J (Ken) Fletcher son of the Branch Director Surgeon Rear Admiral (D) E E Fletcher the founding father of the RN Dental Branch

Returning to the UK at the end of the European phase of the WW II hostilities against Japan still ongoing in 1946 he was appointed to the heavy cruiser HMS CUMBERLAND which was deployed to the Far East to take part in the evacuation of British and Commonwealth troops

In early 1947 Ted Cadman was offered a commission from the RNVR to the Royal Navy on an Extended Service Commission for four years This he accepted

He was promoted Surgeon Lieutenant Commander (D) in August 1950 at the end of his four year regular commission This had coincided with a moratorium on releases from the Armed Forces following the commencement of hostilities in the Korean War Thus in August 1952 he made the decision to transfer to the Permanent List of the Royal Navy

Then followed a series of appointments at HMS CERES (the Supply and Secretariat School near Leeds) HMS HERON (the Naval Air Station at Yeovilton) and the RN Barracks at Chatham and Portsmouth

In June 1956 Ted Cadman was promoted

Surgeon Commander (D) in 1963. He joined the fleet carrier HMS VICTORIOUS as the Senior Dental Surgeon (of two dental officers). This writer was his junior in the ship and found him to be a most benevolent and caring 'sea daddy'.

The ship immediately deployed to the Far East to relieve HMS ARK ROYAL which had become unserviceable. Returning to the UK in mid 1964 he was appointed again to the RN Barracks in Portsmouth and thence in 1965 to the Royal Marines Depot at Deal as Senior Dental Surgeon.

In 1967 he was appointed to the Ministry of Defence as Assistant to the Director of Naval Dental Services at that time Surgeon Rear Admiral (D) W L (Leonard) Mountain and as Staff Dental Surgeon to the Admiral Commanding Reserves.

In December 1967 whilst still in this appointment he was promoted Surgeon Captain (D). There followed an appointment as Command Dental Surgeon to the Flag Officer Naval Air Command at HMS DAEDALUS in Lee-on-the-Solent.

In 1974 he was appointed as Honorary Dental Surgeon to Her Majesty the Queen and on 16th August of the same year he was promoted Surgeon Rear Admiral (D) succeeding Surgeon Rear Admiral (D) John Hunter as Director.

In addition to his service as a general dental practitioner and senior staff officer in the RN Dental Services Ted Cadman had given much time and support to Navy sport serving at various times as President of the RN Hockey Association and as Vice-President of the United Services Rugby Club.

Surgeon Rear Admiral (D) Ted Cadman retired from the Service in September 1977 and was awarded the CB upon retirement.

In retirement Ted keenly followed the fortunes of the RNDS and was a regular attender at the annual luncheon of past Directors. At the 2008 lunch held in the Victoria and Albert Room in HMS NELSON his 90th birthday was toasted vigorously by those present.

Ted Cadman was widowed twice. His first wife Margaret bore him two children Richard and Elizabeth. His second wife Mary MacDonald was a senior WRNS officer who it is rumoured gave up the chance of promotion to Commandant WRNS in favour of marriage to Ted. His third wife Irene was herself the widow of a much esteemed RN dental officer Surgeon Captain (D) Alan Davies.

Ted died after a short illness on 24 April 2010 and is survived by Irene the two children and grandchildren of his first marriage and his step-children and step-grandchildren from his marriage to Irene – all of whom he lovingly welcomed as his own.

A most kindly and generous man who always held the interests of the Royal Navy Dental Branch close to his heart. He is sorely missed and remembered with great affection.

Ted Grant

Obituary

Commander James Charles McKenzie Royal Navy

23 December 1916 – 26 July 2010

Commander James Charles McKenzie Royal Navy Member of the Most Excellent Order of the British Empire and the International Order as a Serving Brother of the St Johns Ambulance in Singapore

The funeral service at the Baptist Church in Sattash was very well attended with the Royal Navy being represented by Surgeon Commodore Noel Bevan Director Royal Naval Medical Service Commander Richard Stead and Sub Lieutenant Thomas McKenzie [illegible]

Born in The Horse and Groom [illegible] he trained as an apprenticed [illegible] started his military career [illegible] Royal Navy but with the South Devon Yeomanry Horse drawn artillery Regiment

He joined the Royal Navy in 1937 as a Petty Officer Technician in the Medical Branch [illegible] ship being HMS Devonshire for which he had a great affection having served in her for four years during which time he travelled world wide including war service escorting Arctic Convoys on the very demanding Murmansk run In the midst of all this he married Betty in 1941 a marriage lasting 69 years during which they brought up a son and a daughter Ian and Christina who presented them with seven grandchildren He also saw active service after the war in the Korean conflict whilst serving in HMS Unicorn as part of the UN Peace Keeping Force

From the very start of his Naval career he was [illegible] earer throughout his service life was spent [illegible] alling upwards with the first ten years carrying out courses at St Johns College Cambridge and The King Edward VI College of Medicine in Singapore including qualifying for Warrant Officer Rank This however was only a preliminary to a further 7 years spent in Scotland and [illegible] On his return to the UK from Gibraltar he [illegible] awarded the [illegible] British Empire [illegible] promotion on 2 years [illegible] Warrant Officer [illegible] duty in Trincomalee [illegible] tasked with closing down the Royal Naval Hospital On completion in 1958 he was further promoted to Lieutenant Wardmaster travelling around the UK Ports finishing off in Malta It is of note that he served in all of the Royal Naval Hospitals Trincomalee Bighi Gibraltar Haslar and Stonehouse 1963 saw a further promotion to Lieutenant Commander and a more or less guaranteed stay in the UK for the foreseeable future though not necessarily in his home port.

Having just failed his early selection for promotion in 1966 he was gazetted for the rank of Commander an outstanding first achievement for a General Duties Officer in the Wardmaster Branch and certainly one he could not refuse even though it meant serving an extra two years and taking up a post in

London where he cont[illegible] retirement in 1968 J[illegible] remarked with a wry smile [illegible] his pension for longer than [illegible]

Throughout his career [illegible] involved in sports including [illegible] Royal Navy at Rugby and swimming [illegible]

serving on the Selectors' Board for Devonport Services for many years.

While James Charles was known to his family as Jim, Dad or Granddad, to the rest of the world he was Jock or Mac, but [illegible] all who were privileged to know him he was [illegible] a foremost officer and a gentleman.

Letter of Condolence [illegible]

Notice has been received of the death of the following:

Surgeon Captain H L Cleave CBE Royal Navy

Surgeon Commander A W Scott Brown Royal Navy

Surgeon Commander (D) M Popperwell Royal Navy

Lieutenant Commander (MS) H E J Davies MBE Royal Navy

Any words in memory of them are gratefully received.

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Acknowledgements

The assistance of those who are not authors but made substantial contributions to the study and/or preparation of the paper should be acknowledged as should the source(s) of grant support, equipment, drugs, facilities, etc.